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NASA CR-132684

A NUMERICALLY EFFICIENT FINITE ELEMENT HYDROELASTIC ANALYSIS

Volume II: Implementation in NASTRAN

PART I

by

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November 1974

(NASA-CR-132684-Vol-2-Pt-1) A NUMERICALLY
EFFICIENT FINITE ELEMENT HYDROELASTIC
ANALYSIS. VOLUME 2: IMPLEMENTATION IN
NASTRAN, PART 1 Final Report (Grumman
Aerospace Corp.) 298 p HC \$9.25 CSCI 20K G3/39

N76-13529

Unclas
05326

Final Report — Prepared Under Contract No. NAS 1-10635-21

by

Grumman Aerospace Corporation

Bethpage, New York 11714

Langley Research Center
Hampton, Virginia

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

FOREWORD

The work described in this report was performed at the Grumman Aerospace Corporation, Bethpage, New York, and administered by the Vibration Section of the Structures and Dynamics Division, NASA Langley Research Center, Hampton, Virginia.

The work performed under NASA Contract NAS1-10635-21 with supplementary funding provided by the Space Division, Rockwell International (POM3WXMZ-483002) included development of a fundamental finite element hydroelastic formulation applicable to NASTRAN, implementation of the theoretical developments into NASTRAN and verification, and demonstration of the new technique on various problems including the 1/8-scale space shuttle external tank model.

ABSTRACT

A fundamental reformulation of the NASTRAN hydroelastic analysis is developed in Volume I on the basis of Toupin's complementary variational principle of classical mechanics and on the basis of a physical interpretation of the NASTRAN fluid matrix equations. Emphasis is placed on the special case of an incompressible fluid model which is applicable to propellant tank hydroelastic analysis. A concise fluid inertia representation results from the assumption of incompressibility and the NASTRAN hydroelastic equations reduce to a simplified form associated with non-fluid structures. The efficiency of the incompressible hydroelastic formulation is enhanced for both fluid and structure by introduction of harmonic reduction as an alternative to Guyan reduction. The theoretical developments are implemented in NASTRAN by use of ALTER-DMAP statements and the modified NASTRAN hydroelastic analysis technique is verified and demonstrated as an efficient and accurate approach by several illustrative problems.

In Volume II the detailed modifications to the NASTRAN hydroelastic analysis are described. The DMAP operations are listed and applied to the 1/8-Scale Shuttle Model External Tank. The resulting mode shapes and frequencies are compared with experimental results.

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1 - INTRODUCTION

A numerically efficient finite element hydroelastic analysis technique and a special purpose reduction technique for geometrically axisymmetric structures have been developed and presented in Volume I (low number NASA CR to be published). While the formulation is quite general, it is particularly applicable to the NASTRAN program which contains a set of fluid finite elements currently limited to axisymmetric geometry. The present report contains details of the implementation of the new formulation into NASTRAN including descriptions of the DMAP statements required for conversion of the program and details pertaining to problem definition and bulk data considerations. Details of the current 1/8-scale space shuttle external tank mathematical model, numerical results and analysis/test comparisons are also presented. The appendices include a description and listing of a FORTRAN program used to develop harmonic transformation bulk data (multipoint constraint statements) and sample bulk data information for a number of hydroelastic problems.

2 - MODIFICATION OF THE NASTRAN HYDROELASTIC ANALYSIS

Modification of the NASTRAN hydroelastic analysis according to the theoretical considerations discussed previously has been implemented by the use of ALTER-DMAP statements in Rigid Formats 7 (complex eigenvalue analysis), 3 (normal modes analysis), and 13 (undamped vibration analysis with static pre-load effects).^{*} Rigid Format 7 has been modified and condensed considerably since its function in the present application is to calculate fluid matrix data. The fluid matrix data formed in Rigid Format 7 is output onto cards or tape and used as input data for a normal modes analysis in either Rigid Format 3 or 13. Rigid Format 3 is used in cases where differential stiffness due to pressurization and/or fluid weight is negligible and Rigid Format 13 is used when such effects are significant. The modifications in Rigid Formats 3 and 13 are minimal, consisting of the addition of the fluid mass matrix to the structural mass matrix in the analysis set and the recovery of pressure and dependent displacement data after calculation of the modal solutions. In addition to the modifications of the Rigid Formats, special bulk data information must be formed to perform the operations required in the present applications.

2.1 DESCRIPTION OF DMAP OPERATIONS FOR FORMULATION OF FLUID DATA

The following is an outline of the major operations performed in Rigid Format 7 for the preparation of fluid matrix data. Operations utilized in both the general case (gravitational and/or ullage stiffness included) and the special case (zero free surface pressure) are presented.

3. GP1 generates coordinate system transformation matrices, tables of grid point locations, and tables for relating internal and external grid point numbers.
8. GP2 generates Element Connection Table with internal indices.
23. TA1 generates element tables for use in matrix assembly and stress recovery.

^{*}Note: Rigid Format 13, although not documented in the latest NASTRAN manuals is included in the level 15 series programs.

28. SMA1 generates stiffness matrix $[K_{gg}^x]$, structural damping matrix $[K_{gg}^4]$ and Grid Point singularity Table.
42. Equivalence $[K_{gg}^x]$ to $[K_{gg}]$ if no general elements.
44. Go to DMAP No. 47 if no general elements.
45. SMA3 adds general elements to $[K_{gg}^x]$ to obtain stiffness matrix $[K_{gg}]$.
49. GP4 generates flags defining members of various displacement sets (USET) and forms multipoint constraint equations $[R_g] \{u_g\} = 0$.
52. Equivalence $[K_{gg}]$ to $[K_{nn}]$, $[M_{gg}]$ to $[M_{nn}]$, $[B_{gg}]$ to $[B_{nn}]$ and $[K_{gg}^4]$ to $[K_{nn}^4]$ if no multipoint constraints.
54. Go to DMAP No. 59 if general elements present.
55. Go to DMAP No. 59 if no structural elements.
56. GPSP determines if possible grid point singularities remain.
57. OFP formats table of possible grid point singularities and places it on the system output file for printing.
60. Go to DMAP No. 65 if MCE1 and MCE2 have already been executed for current set of multipoint constraints.
61. MCE1 partitions multipoint constraint equations $[R_g] = [R_m | R_n]$ and solves for multipoint constraint transformation matrix $[G_m] = -[R_m]^{-1} [R_n]$.
63. MCE2 partitions stiffness, matrix

$$K_{gg} = \begin{bmatrix} \bar{K}_{nn} & K_{nm} \\ K_{mn} & K_{mm} \end{bmatrix}$$

and performs matrix reduction

$$[K_{nn}] = [K_{nn}] + [G_m^T] [K_{mn}] + [K_{mn}^T] [G_m] + [G_m^T] [K_{mm}] [G_m],$$

66. Equivalence $[K_{nn}]$ to $[K_{ff}]$, if no single-point constraints.

68. Go to DMAP No. 71 if no single-point constraints.

69. SCE1 partitions out single-point constraints

$$K_{nn} = \begin{bmatrix} K_{ff} & K_{fs} \\ K_{sf} & K_{ss} \end{bmatrix}$$

72. Equivalence $[K_{ff}]$ to $[K_{aa}]$ if no omitted coordinates.

74. Go to DMAP No. 88 if no omitted coordinates.

95. BMG generates DMIG card images describing the interconnection of the fluid and the structure.

100. MTRXIN generates fluid boundary matrices $A_{b,fl}$ and $K_{b,fl}$ if a fluid structure interface is defined. The matrix $K_{b,fl}$ is generated only for a nonzero gravity in the fluid.

104. Go to next DMAP instruction if cold start or modified restart. LBL13 will be altered by the Executive System to the proper location inside the loop for unmodified starts within the loop.

105. Beginning of loop for additional sets of direct input matrices.

107. CASE extracts user requests from CASECC for current loop.

110. MTRXIN selects the direct input matrices for current loop, $[K_{pp}^{2d}]$.

114. Equivalence $[K_{pp}^{2d}]$ to $[K_{pp}^{2x}]$ if no $[K_{b,fl}]$

115. Go to DMAP No. 112 if no $[K_{b,fl}]$.

116. Equivalence $[K_{b,fl}]$ to $[K_{pp}^{2x}]$ if no $[K_{pp}^{2d}]$.

117. Go to DMAP No. 112 if no $[K_{pp}^{2d}]$.

118. ADD assembles matrix $[K_{pp}^{2x}] = [K_{b,fl}] + [K_{pp}^{2d}]$.

122. ADD subtracts $[A_{b,fl}]$ from $[K_{pp}^{2x}]$ to obtain $[K_{pp}^2]$.

130. Equivalence $[K_{pp}^2]$ to $[K_{dd}^2]$ if no constraints applied.

The following set of statements is utilized when either gravitational stiffness is included in the analysis or free surface displacement data is desired. Copies of the ALTER-DMAP statements and the complete DMAP listing are presented in Figs. 2-1 and 2-2, respectively

136a. Partition $[K_{dd}]$ to form the fluid inertance matrix $[K_{bp}]$, the surface area matrix $[A_{em}]$ and the surface gravitational stiffness matrix $[K_e]$

$$[K_{dd}] = \begin{bmatrix} K_{bp} & 0 \\ A_{em} & K_e \end{bmatrix}$$

The vector $\{P_g\}$ partitions the "d" set as follows

$$\begin{Bmatrix} p \\ u \end{Bmatrix}$$

136b. Partition $[K_{bp}]$ to form free surface and structural interface matrices (Note: in the case where gravitational effects are included the free surface pressure subset consists of a single zeroth harmonic pressure)

$$K_{bp} = \begin{bmatrix} K_{11} & K_{12} \\ K_{21} & K_{22} \end{bmatrix}$$

136c. Partition $[A_{em}]$ to form free surface and structural interface matrices (Note: in the case where gravitational effects are included the free surface displacement subset consists of a single zeroth harmonic displacement)

$$A_{em} = \begin{bmatrix} A_{1m} & 0 \\ 0 & A_{2m} \end{bmatrix}$$

Volume II

- 136d. Partition K_e to form free surface and structural interface matrices

$$K_e = \begin{bmatrix} K_{e11} & 0 \\ 0 & K_{e22} \end{bmatrix}$$

- 136e. Calculate the transpose of A_{2m} , A_{2m}^T

- 136f. Solve for the pressure deviation recovery matrix

$$[P_{du2}] = [K_{22}]^{-1} [A_{2m}^T]$$

- 136g. Calculate the symmetric fluid mass matrix

$$[M_{fLd}] = [A_{2m}] [P_{du2}]$$

- 136k,l. Solve $[M_2] = [A_{1m}]^{-1} [K_{12}]$

and form the displacement recovery matrix

$$[T_{u12}] = [M_2] [P_{du2}]$$

- 136m. Output onto cards or tape: $[M_{fLd}]$, $[P_{du2}]$, $[T_{u12}]$ *

- 136n. Form the reduced gravity stiffness matrix

$$[K_{eb}] = [T_{u12}^T] [K_{e11}] [T_{u12}] + [K_{e22}]$$

- 136o. Solve for the pressure recovery matrix (for the case of nonzero gravitational stiffness)

$$[C_{p2}] = - [K_{22}^{-1}] [K_{21}]$$

- 136p. Output into cards or tape

$$[K_{eb}], [K_{11}], \text{ and } [C_{p2}]$$

170. EXIT

*OUTPUT 3 for punched card DMI output is utilized in the listings presented in this report; if tape output is desired OUTPUT 1 should be used.

MAY 24, 1974 NASIRAN 2/1/73

```

NASTRAN EXECUTIVE CONTROL DECK ECTC

10 HYBRD, COPPOLINO
APH DISO
SOL 7.6
TIME 5
CHKPNT YES
DIAG 7.8, 13.14, 15.21, 22
ALTER 50
MATGPR GPL, LSET, SIL, HGG, /C, N, G
MATGPR GPL, LSET, SIL, KGG, /C, N, G
ALTER 73
MATGPR GPL, LSET, SIL, HFF, /C, N, F
MATGPR GPL, LSET, SIL, KFF, /C, N, F
ALTER 101
MATGPR GPL, LSET, SIL, ABFL, /C, N, F
MATGPR GPL, LSET, SIL, K3FL, /C, N, F
ALTER 122
ADD ABFL, M2DPP, M3PP, /V, N, WFACT 5
ALTER 123, 124
ALTER 136
MATGPR GPLD, LSETD, SILD, HGD, /C, N, D
MATGPR GPLD, LSETD, SILD, KDD, /C, N, D
SECMAT HGG, KGG, HFF, KFF, ABFL, /C, N, PRINT
SECMAT K3FL, KDD, KDD, /C, N, PRINT
PARTN KDD, /C, N, KDD, AEP, /C, N, -1 5
PARTN KDD, /C, N, K21, K21, K22, /C, N, -1 5
PARTN ABFL, G, ALP, /V, N, A2P, /C, N, 1 5
PARTN KE, UP, /KE1, /C, N, KE2, /C, N, -1 5
TENJP AZM/A2MT 5
SOLVE K22, ARYT/PDU2/C, N, 1/C, N, -1 5
SOLVE ALM, 5, 12, /M2L/C, N, 1 5
MAYAD M2L, HGU2, /TUI1/C, N, 0/C, N, -1 5
ADD PDU2, /PDU1/C, N, A555=(1.0, C, C) 5
FARM /C, N, MCP/V, N, TRLE=-1 5
EQUIV PDU3, PDU2/TRUE 5
CURD POUNCS, TRUE 5
MATPRN PDU3, /C, N, 1 5
LABEL POUNC 5
MAYAD AZM, PDU2, /MFLD/C, N, C/C, N, -1 5
OUTPUT3 MFLD, PDU2, TUI2, /C, N, 0/C, N, 1=AMF/C, N, 2=ARD/C, N, 3=ATU 5
SNAYAD TUI2, KE1, TUI2, /C, N, 3/KE2/KEB/C, N, 3/C, N, 1/C, N, 2/C, N, 1 5
SOLVE K22, K21, GP2/C, N, 1/C, N, -1 5
MATPRN K11, K12, K22, /C, N, 1 5
MATPRN ALM, A2M, KE1, /C, N, 1 5
MATPRN PDU2, MFLD, TUI2, /C, N, 1 5
MATPRN KE0, K11, CP2, /C, N, 1 5
LABEL ERFOR3 5
ALTER 137, 170
EXIT
ENDALTER

```

Fig. 2-1 Rigid Format 7 ALTER-DMAP Statements (with Free Surface Displacement Recovery)

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N A S T R A N S C U R C E P R O G R A M C O M P I L A T I O N
DMAP-DMAP INSTRUCTION
NO.

```

1 BEGIN NO. 7 DIRECT COMPLEX EIGENVALUE ANALYSIS - SERIES M1 $
2 FILE KGGX=TAPE/ KGG=TAPE/ GGD=SAVE/ GMD=SAVE $
3 GP1 GEOM1,GEOM2, /GFL,GEOMIN,GPDT,CSTM,EGFDT,SIL/V,N,LUSET/ C,N,
    123/V,N,NGGPD1 $
4 SAVE LUSET,NGGPD1 $
5 PURGE USE1,GM,GG,KAA,BAA,MAA,KAA,KFS,FST,ECT,FLTSETX,PLTPAR,GPSETS,
    ELSETS,NGGPD1 $
6 CHKPNT GPL,GEOMIN,GPDT,CSTM,EGFDT,SIL,USE1,GM,CG,KAA,EAA,MAA,KAAA,EST,
    ECT,PLTSETX,PLTPAR,GPSETS,ELSETS $
7 COND LBL5,NGGPD1 $
8 GP2 GEOM2,GEOMIN/ECT $
9 CHKPNT ECT $
10 PLTSET PGDD,FOEXIN,ECT/FLTSETX,PLTPAR,GPSETS,ELSETS/V,N,NSIL/ V,N,
    JUMPPLD1 $
11 SAVE NSIL,JUMPFLCT $
12 PRMSG PLTSET/// $
13 SETVAL //V,N,PLTFLG/C,N,I/V,N,PFILE/C,N,C $
14 SAVE PLTFLG,PFILE $
15 COND P1,JUMPFLCT $
16 PLJT PLTPAR,GPSETS,ELSETS,CASECC,BGPDT,FOEXIN,SIL, /PLOTX1/ V,N,
    NSIL/V,N,LLSET/V,N,JUMPFLD1/V,N,PLTFLG/V,N,PFILE $
17 SAVE PFILE $
18 PRMSG PLOTX1// $
19 LABEL P1 $
20 CHKPNT PLTPAR,GPSETS,ELSETS $
21 GP3 GEOM3,GEOMIN,GEOM2, /GPTT/C,N,123/V,N,NGGPD1/C,N,123 $
22 CHKPNT GPTT $

```

Fig. 2-2 Rigid Format 7 DMAP Listing (with Free Surface Displacement Recovery) (Sheet 1 of 8)

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Fig. 2-2 Rigid Format 7 DMAP Listing (with Free Surface Displacement Recovery) (Sheet 2 of 8)

MAY 24, 1974 NASTRAN 2/ 1/73

CYLINDRICAL FLUID

NASTRAN SOURCE PROGRAM COMPILATION

DMAP-DMAP INSTRUCTION
NU.

```

45 SVA3 GET,KGG,KGG/V,N,LUSET/V,N,NGENL/V,N,NCSIMP $
46 CHKPT KGG $
47 LABEL LRL11 $
48 PARAM Z/C,N,UBV/V,N,NSKIP/C,N,C/C,N,C $
49 GP4 CASEC,GECA,GECA,XIN,SIL,GPDT/AG,USET/V,N,LUSET/V,N,MPCF1/V,
N,MPCF2/V,N,SINGLE/V,N,CMIT/V,N,FFACT/V,N,NSKIP/V,N,REPEAT/
V,N,NOSET1=-1/V,N,NCL/V,N,NOA=-1 $
50 SAVE MPCF1,MPCF2,SINGLE,CMIT,NSKIP,NOSET,REACT,REPEAT,NCL,NCA $
50 MATGPR GPL,USET,SIL,MGG//C,N,G
50 MATGPR GPL,USET,SIL,MGG//C,N,G
51 PURGE, CM,GND/MPCF1/GC,GDT/CMIT/KFS,CFC/S:NGLE $
52 EQUIV KGG,KNN/MPCF1/MGG,MNN/MPCF1/EGG,ENN/MPCF1/K4GG,K4NN/MPCF1 $
53 CKPNT CM,GMD,RG,GB,GCD,KFS,CFC,USET,KNN,MNN,BNN,K4NN $
54 COND LRL4,GENFL $
55 COND LBL4,NCSIMP $
56 GPSP GPL,GPST,USET,SIL/CGPST $
57 OFF DGPST,....//V,N,CARDNC $
58 SAVE CARDNC $
59 LABEL LBL4 $
60 COND LBL2,MPCF2 $
61 MCE1 USET,PG/GW $
62 CHKPT CM $
63 MCE2 USET,GM,KGG,MGG,BGG,K4GG/KNN,MNN,BNN,K4NN $
64 CHKPT KNN,MNN,BNN,K4NN $
65 LABEL LBL2 $
66 EQUIV KNN,KFF/SINGLE/MNN,MFF/SINGLE/ENN,BFF/SINGLE/K4NN,K4FF/SINGLE $

```

Fig. 2-2 Rigid Format 7 DMAP Listing (with Free Surface Displacement Recovery) (Sheet 3 of 8)

MAY 24, 1974 NASTRAN 2/1/73

CYLINDRICAL FLUID

N A S T R A N S C R I P T P R O G R A M C O M P I L A T I O N

DMAP-DMAP INSTRUCTION

NO.

```

67  CKPNT  KFF,MFF,BFF,K4FF $
68  COND  LBL3,SINGLE $
69  SCE1   USET,KIN,MAN,BNN,K4NN/KFF,KFS,MFF,BFF,K4FF $
70  CKPNT  KFS,KFF,MFF,BFF,K4FF $
71  LABEL  LBL3 $
72  EQUIV  KFF,KAA/CPIT/ MFF,MAA/CNIT/BFF,AAA/CPIT/K4FF,K4AA/ONIT $
73  CKPNT  KAA,MAA,BAA,K4AA $
73  MATGPR GPL,USET,SIL,MFF//C,N,F
73  MATGPR GPL,USET,SIL,KFF//C,N,F
74  COND  LBL5,CPIT $
75  SMP1   USET,KFF,,,/GC,MAA,KCC,LGC,UCE,.... $
76  CKPNT  GO,KAA $
77  COND  LBL4,NEWGG $
78  SMP2   USET,GO,MFF/MAA $
79  CKPNT  MAA $
80  LABEL  LBL4 $
81  COND  LBL8,NORGG $
82  SMP2   USET,GC,BFF/BAA $
83  CKPNT  BAA $
84  LABEL  LBL8 $
85  COND  LBL5,NCK4GG $
86  SMP2   USET,GC,K4FF/K4AA $
87  CKPNT  K4AA $
88  LABEL  LBL5 $
89  DPD    DYNAMICS,GFL,SIL,USET/GFLD,SIL,USET,TFFGOL,....,ELC,PDYN/V,
           N,LUSET/V,N,LUSE TD/V,N,NCTFL/V,N,NCELT/V,N,NOPSOL/V,N,NORRL/

```

Fig. 2-2 Rigid Format 7 DMAP List'ig (with Free Surface Displacement Recovery) (Sheet 4 of 8)

CYLINDRICAL FLUID

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N
 DMAP-DMAP INSTRUCTION

```

ND.
      V.N,NDNLFI/V,N,NCTRL/V,N,NOREC/C,N,123/V,N,NQUE $
90 SAVE      LUSEID,NCLE $
91 EQUJY     GO,GDD/NCLE/G,N,GMD/NQUE $
92 CHKPNIT   USETD,SED,EDDYN,,TFFCCL,GCD,GMD,SILD,GPLE $
93 PARAM     //C,N,ADD//N,NEVER/C,N,1/C,N,C $
94 PARAM     //C,N,MPY/V,N,REPEATS/C,N,1/C,N,-1 $
95 DNG       MATFEOL,BGRDT,EGEXIN,CSTM/BDSCCL/V,N,NCKEFL/V,N,NDABFL/V,N,
      HEACT $
96 SAVE      MFACT,NCKBFL,NCAEFL $
97 PARAM     //C,N,AND/V,N,NCFI/V,N,NCAEFL/V,N,NCKEFL $
98 PURGE     KBFL/NCKBFL/ ABFL/NCAEFL $
99 COND      LBLFL3,NEFL $
100 MTRXIN,,.DDDDOOL,EDDYN,,ABFL,KBFL,/V,N,LUSEID/V,N,NDABFL/V,N,NCKEFL/C,
      N.O $
101 SAVE      NDABFL,NCKEFL $
101 MATGPR GPL,LUSET,SIL,ABFL//C,N,F
101 MATGPR GPL,LUSET,SIL,KBFL//C,N,P
102 LABEL     LBLFL3 $
103 CHKPNIT   ABFL,KBFL $
104 JUMP      LBL13 $
105 LABEL     LBL13 $
106 PURGE     P4ID,CLAMA,QPHID,COPCI,CCPHIF,CESCI,CEFCI,CPHIP,QPC, K2PP,
      W2PP,U2PP,K2DD,W2DD,D2DD,NEVER $
107 CASE     CASECC//CASEXX/C,N,CEIGN/V,N,REPEATS/V,N,NLOJF $
108 SAVE      REPEATS,NCLCCP $
109 CHKPNIT   CASEXX $
110 MTRAIN    CASEXX,MATPCCL,EDDYN,,TFFCCL/K2CFF,W2CFF,E2PP/V,N,LUSEID/V,N,

```

Fig. 2-2 Rigid Format 7 DMAP Listing (with Free Surface Displacement Recovery (Sheet 5 of 8))

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MAY 24. 1974 NASTRAN 2/1/73

CYLINDRICAL FLUID

NASTRAN SOURCE PROGRAM COMPILATION

DMAP-DHAP INSTRUCTION

NO.

NOK2DPP/V,N,NCM2DPP/V,N,NCB2FF \$

111 SAVE NOK2DPP,NCM2DPP,NCB2FF \$

112 PARAM //C,N,AND/V,N,NCM2FF/V,N,NOABFL/V,N,NCM2EPP \$

113 PARAM //C,N,AND/V,N,NCM2FF/V,N,NCFL/V,N,NCM2EPP \$

114 EQUIV K2DPP,K2XFF/NCMFL/ K2DFF,M2FF/NCABFL \$

115 COND LBLFL1,NCMFL \$

116 EQUIV K3FL,K2XFF/NCM2DFF \$

117 COND LBLFL1,NCM2DPP \$

118 ADD K3FL,K2DPP/K2XFF \$

119 LABEL LBLFL1 \$

120 EQUIV K2XPP,K2FF/NCMFL \$

121 COND LBLFL2,NCMFL \$

122 ADD ABFL,K2XFF/K2FF/C,N,(-1.0,0.0) \$

122 ADD ABFL,M2DPP/M2FF/V,N,MFACT \$

125 LABEL LBLFL2 \$

126 PARAM //C,N,AND/V,N,NDERA/V,N,NGUL/V,N,NCB2FF \$

127 PARAM //C,N,AND/V,N,NDERA/V,N,NGUE/V,N,NCM2FF \$

128 PARAM //C,N,AND/V,N,NDER2/V,N,NGENL/V,N,NCM2FF \$

129 PURGE K2DD/NCM2FF/M2DD/NCM2FF/H2DD/NCM2FF \$

130 EQUIV M2PP,M2DD/NCM2FF/H2DD/NCM2FF/K2FF/NCM2FF/M2AA,NCM2M2AA,NCM2M2AA \$

131 CHKPNT K2PP,M2PP,M2FF,K2DD,M2DD,B2DD,FCC,M2C \$

132 COND LBL18,NOGR3T \$

133 GAO USE TD,GM,GC,KAA,EA,M2AA,K4AA,K2FF,M2FF,E2PP/KCC,BUD,MFC,CMD,
GDD,K2DD,M2DD,H2DD/C,N,CMPLX/C,N,BISP/C,N,DIRECT/C,Y,C,C,0/C,
N,0,C/C,N,C,C/V,N,NCM2FF/V,N,NCM2FF/V,N,NCM2FF/V,N,NCM2FF/V,N,
N,SINGLE/V,N,DMIT/V,N,NCUE/V,N,NCM2FF/V,N,NCM2FF/V,N,NCM2FF/V,N,
-1 \$

Fig. 2-2 Rigid Format 7 DMAP Listing (with Free Surface Displacement Recovery (Sheet 6 of 8))

MAY 29, 1974 NASTRAN 2/1/73

CYLINDRICAL FLUID

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N
 DMAP-DMAP INSTRUCTION
 NO.

```

134 LABEL LUL18 $
135 EQUIV B2DD,BDD/NCBGG/ M2DD,MDD/NOSLWF/ K2CC,KCC/KDEK2 $
136 CHKPR KDD,BDD,MDD,GCG,GMO $
136 MATGPR GPLD,USETD,SELD,MDD//C,N,D
136 MATGPR GPLD,USETD,SELD,KDD//C,N,D
136 SEEMAT HGG,KGG,MFF,MFF,ARFL//C,N,PRINT
136 SEEMAT KUFL,MDD,KDD,.,./C,N,PRINT
136 PARTN KDD,P9,./KBP,AEK,.,KE/C,N,-1 $
136 PARTN KBP,G9,./K11,K21,K12,K22/C,N,-1 $
136 PARTN AEK,G9,UP/A1N,.,A2M/C,N,1 $
136 PARTN KE,UP,./KE1,.,KE2/C,N,-1 $
136 TRANSP A2M/A2HT $
136 SOLVE K22,A2M/PDL2/C,N,1/C,N,-1 $
136 SOLVE A1M,K12/M2L/C,N,1 $
136 MPYAD H2L,PDL2,./TL12/C,N,0/C,N,-1 $
136 ADD PDL2,./PDL3/C,N,A979=(1,0,0,0) $
136 PARAM /C,N,NUP/V,N,TRUE=-1 $
136 EQUIV PDL3,PDL2/16LE $
136 COND PDL3,TRUE $
136 MATPRN PDL3,.,.,./ $
136 LABEL PDUNG9 $
136 MPYAD A2M,PDL2,./MFLD/C,N,0/C,N,-1 $
136 OUTPUT3 MFLD,PDL2,./TL12,.,./C,N,0/C,N,1=AEF/C,N,K2=1PD/C,N,N3=AFU $
136 SMYAD TU12,KE1,TL12,.,KE2/KEB/C,N,3/C,N,1/C,N,1/C,N,2/C,N,1 $
136 SOLVE K22,K21/EP2/C,N,1/C,N,-1 $

```

Fig. 2-2 Rigid Format 7 DMAP Listing (with Free Surface Displacement Recovery) (Sheet 7 of 8)

MAY 24, 1974 NASTRAN 2/1/73

CYLINDRICAL FLUID

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

DMAP-DMAP INSTRUCTION
NO.

136 MATPRN K11.K12.K22./// \$

136 MATPRN A1M.A2M.ME1./// \$

136 MATPRN PDU2.MFLD.TL12./// \$

136 MATPRN KEG.K11.CP2./// \$

136 LABEL ERROR3 \$

170 EXIT

171 END \$

NO ERRORS FOUND - EXECUTE NASTRAN PROGRAM

Fig. 2.2 Rigid Format 7 DMAP Listing (with Free Surface Displacement Recovery) (Sheet 8 of 8)

Volume II

The following set of DMAP statements are utilized when gravitational stiffness is ignored and free surface displacement data is not desired. Copies of the ALTER-DMAP statements and the complete DMAP listing are presented in Figs. 2-3 and 2-4, respectively.

- 136a. Partition $[K_{dd}]$ to form the fluid inertance matrix $[K_{bp}]$ and the surface area matrix $[A_{em}]$

$$[K_{dd}] = \left[\begin{array}{c|c} K_{bp} & 0 \\ \hline A_{em} & 0 \end{array} \right]$$

- 136b. Calculate the transpose of $[A_{em}]$, $[A_{em}^T]$

- 136c. Solve for the pressure recovery matrix

$$[P_{du2}] = [K_{bp}^{-1}] [A_{em}^T]$$

- 136d. Calculate the fluid mass matrix

$$[M_{fld}] = [A_{em}] [P_{du2}]$$

- 136e. Output into cards or tape $[P_{du2}]$ and $[M_{fld}]$.

170. EXIT.

2.2 DESCRIPTION OF DMAP OPERATIONS FOR HYDROELASTIC NORMAL MODES ANALYSIS

The following is an outline of the major operations performed in Rigid Format 3 for free vibration analysis of a hydroelastic system. The special case of zero free surface pressure has been verified in test cases and the general case which has not been verified is also presented. The modifications required for a Rigid Format 13 hydroelastic analysis with differential stiffness are nearly identical as those required in Rigid Format 3; thus a description of DMAP operations is not included. ALTER-DMAP statements and modified Rigid Format DMAP listings, however, are presented for Rigid Format 13 as well as Rigid Format 3.

TRANSMISSION CALCULATIVE CONTROL DECK EFFECT

[illegible]

Fig. 2-3 Rigid Format 7 ALTER-DMAP Statements (without Free Surface Displacement Recovery)

U.S. INFLUENCE IN THE MIDDLE EAST

VASTRAY, S. L. P. P. C. P. A. M. C. C. M. P. L. A. T. I. O. N.
D. M. A. P. I. N. S. T. R. U. C. T. I. O. N.
N. U. 0.

```

1 BEGIN 40.7 OBJECT COMPLEX EIGENVALUE ANALYSIS - SERIES 41
2 FILE KUGA=NAME/ KGS=TABLE/ GOU=SAVE/ GWD=SAVE
3 GP1 GCM1=ELCMB/ GFL=ELXIN+GPDTCSTP+HGRDT/SIL/V.N.LUSET/ C.N.
    12/V.N.HGRDT
4 SAVE LUSLT+HGRDT
5 PU=GO UALTCN/GO,KAA,KAA,KAA,KAA,NFS,S.EST,+CT,PLISETX,PLTHAP,GPSSETS,
    ELSETS+HGRDT
6 CRPNT GFL+ELXIN+HGRDT,CSTP,JGRDT,SIL,LUSLT,GW,GO,KAA,FAA,KAA,KAA,EST,
    ELPLTSETX,PLTHAP,GPSSETS,ELSETS
7 CORD LUSLT,HGRDT
8 OPE USLM,ROXIN/ECT
9 CRPNT ECT
10 PLTSET PLJGRDT+EL/PLTSETX,PLTHAP,GPSSETS,ELSETS/V.N.NSIL/ V.N.
    JUMPLUT
11 SAVE NSIL,JUMPLUT
12 PRMISC PLTSETX
13 LUTAL /V.N.PLTHAP/C.N./V.N.PLTHAP/C.N.
14 SAVE PLTHAP,FILE
15 CORD PLJUMPLUT
16 PLT PLTHAP,GPSSETS,ELSETS,CASECC,HGRDT,ELXIN,SIL,PLUTX/V.N.
    NSIL/V.N.LUSET/V.N.JUMPLUT/V.N.PLTHAP/V.N.PLTHAP
17 SAVE FILE
18 PRMISC PLTHAP
19 LUTAL
20 CRPNT PLTHAP,GPSSETS,ELSETS
21 GPJ GEURJ,ELXIN,GEUR2/GOIT/C.N.12/V.N.NCCFAY/C.N.12
22 CRPNT GPT

```

Fig. 2-4 Rigid Format 7-DMAP Listing (without Free Surface Displacement Recovery) (Sheet 1 of 7)

JUNE 12, 1974 NASTRAN 2/ 1/73

CYLINDRICAL FLUID

NASTRAN SOLUTION PROGRAM COMPILATION

DMAP=DMAP INSTRUCTION

23 1AL1 .ECT,EP1,SGD1T,SEL,GP1T,CSTNVEST,GE1,ECPT,GPCT/V,N,LJSET/ C,N,
121/V,N,NGENL=1/C,N,12/V,N,NGENL=1/V,N,NGENL

24 SAVE VJ,IMP,NGENL,GENEL

25 FORCE K400,UPST,DP,ST,K300,UGU,KANN,K4FF,K4AA,KAN,VFF,MAA,ENN,BFF,LAA,
K30A/NGENL / UPST/GENEL

26 CHKPT EST,ECPT,GPCT,GE1,K400,UPST,K300,BGG,K30Y,UPST, KANN,K4FF,
K4AA,KNN,HEP,MAA,ENN,BFF,MAA

27 COND LUL1,NGENL

28 SNA1 C3TN,MPT,ECPT,GPCT,DIT/K30X,K4GG,GPST/V,N,NGENL/V,N,NGENL

29 SAVE VOR,K30

30 FORCE K4NN,K4FF,K4AA,K4GG

31 CHKPT K30A,UPST,K4TH,K4NN,K4FF,K4AA

32 SMA2 CSTN,MPT,ECPT,GPCT,DIT/200,UGU/V,N,MASS,1,2/V,N,NGENL/V,N,
VOR,K30,V,Y,COLPMASS/V,Y,C3PAR/V,Y,C3ED/V,Y,C3JUAL/V,Y,
C3JUAL,2/V,Y,C3TH,12/V,Y,C3TUBE/V,Y,C3DHLI/V,Y,
C3TPL,1/V,Y,C3TUSC

33 SAVE N3M30,NEEG

34 FORCE G3N,DFT,12AA/NGENL/MAA,VFF,MAA/NGENL

35 CHKPT NGU,MNA,VFF,MAA,JGG,MNA,UFF,12AA

36 COND LUL1,GPENT

37 COND E3F03,NGENL

38 U400 UGPD1,CSTN,ENEXIN,MUG/U400/V,N,GPENT=1/V,N,MASS

39 UFF E3F05,12AA/2/V,N,CARDND

40 SAVE CARDND

41 LABEL LUL1

42 EQUIV K30A,K30/NGENL

43 CHKPT K30

44 COND LUL1,NGENL

Fig. 2-4 Rigid Format 7-DMAP Listing (without Free Surface Displacement Recovery) (Sheet 2 of 7)

JUNE 12, 1974 NASIPAN 2/ 1/73

CYLINDRICAL FLUID

H A S T E R A N S C A 2 C P F U G R A M C C M P I L A T I O N
UNMAP-DUMP INSTRUCTION

NO.

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45 SMAJ  G61.KGG/KGG/V.N.LUSE1/V.N.NGSEAL/V.N.NCSIMP 5
46 CKNPNT  KGG 5
47 LABEL  LBL1: 5
48 PAFAM  /ZC.N.MPY/V.N.NSKIP/C.N.N/C.N.G 1
49 GP4  CASECC.GP4M4TJIXIN.SEL.GPOT/IG.G.USET/V.N.LUSL/V.N.MPCF1/V.
      N.MPCF2/V.N.SINGLE/V.N.NLPT/V.N.NREACT/V.N.NSKIP/V.N.NREPEAT/
      V.N.NDEL1=1/V.N.NOL/V.N.NDA=-1 5
50 SAVE  MPCF1.MPCF2.SINGLE.LIMIT.NSKIP.NEST.REACT.NHEAT.NGL.NCF 1
51 MATGPR  GPL.USET.SEL.KGG/ZC.N.G
52 MATGPR  GPL.USET.SEL.KGG/ZC.N.G
53 PUGLE  GN.GND/MPCF1/IG.GCD/CHIT/NF.S.GFC/SINGLE 1
54 LDU1V  R10.KIN/MPCF1/IG.G.MN/MPCF1/EGG.UNN/MICEL/NOGG.KANN/MPCF1 5
55 CKNPNT  GAGM.JKG.MT.GG.KFS.MPCF1SET.KNN.MNN.MNN.MNN 5
56 LBL4  LBL4.GENEL 5
57 LBL4  LBL4.NCSIMP 5
58 GPSP  GPL.USET.SEL.SEL/UGPST 5
59 UFS  UGFST...../V.N.CARUND 5
60 SAVE  CARUND 1
61 LABEL  LBL4 5
62 LBL4  LBL4.MPCF2 5
63 ALZ1  USET.N.GCM 5
64 CKNPNT  GN 5
65 ALZ2  USET.GM.KGG.MT.GG.EGGO/KNN.PNN.MNN.KANN 5
66 CKNPNT  CKN.MNN.MNN.KANN 5
67 LABEL  LBL2 5
68 LDU1V  KNN.MPF/SINGLE/MNN.MPF/SINGLE/BNN.MPF/SINGLE/KNN.MPF/SINGLE 1

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Fig. 2-4 Rigid Format 7-DUMP Listing (without Free Surface Displacement Recovery) (Sheet 3 of 7)

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JUNE 12, 1974 NASIKAN 2/ 1/73

CYLINDRICAL PLUID

N A S T R A N S D L P C E P H G G F A C C M P I L A T I C U
DAMP-DAMP INSTRUCTION
NO.

```

67 CHKPNT <FF,IFF,IFF,K4FF >
68 COND L4L3,5,ENGL >
69 SCL1 USLT,KNA,MNN,INN,K4NR/KFF,KPS,MFF,BFF,K4FF >
70 CHKPNT <KFS,KFF,IFF,IFF,K4FF >
71 L40C L4L3 >
72 ECUV KFF,KAA/CMIT/ MFF,KAA/CMIT/TAFF,EA/CMIT/K4FF,K4AA/CMIT >
73 CHKPNT KAA,MAA/IAA,K4AA >
74 MAT CPM GPL,USLT,5,IL,IFF/CIN,F
75 MAT GPR GP,USLT,5,IL,KFF/CIN,F
76 COND L4L3,CMIT >
77 SMP1 USLT,KFF,5,5,5,KAA,KCC,L40,UBC,.... >
78 CHKPNT GC,KAA >
79 L40V L4L3,CMIT >
80 SMP2 USLT,GO,MFF/MAA >
81 CHKPNT MAA >
82 L4JEL L4L4 >
83 COND L4L3,INJCG >
84 SMP2 USLT,GO,MFF/MAA >
85 CHKPNT L4A >
86 L4JEL L4L3 >
87 L4JEL L4L3,CMIT >
88 L4JEL L4L3,CMIT >
89 L4JEL L4L3,CMIT >
90 L4JEL L4L3,CMIT >
91 L4JEL L4L3,CMIT >
92 L4JEL L4L3,CMIT >
93 L4JEL L4L3,CMIT >
94 L4JEL L4L3,CMIT >
95 L4JEL L4L3,CMIT >
96 L4JEL L4L3,CMIT >
97 L4JEL L4L3,CMIT >
98 L4JEL L4L3,CMIT >
99 L4JEL L4L3,CMIT >

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Fig. 2-4 Rigid Format 7-DAMP Listing (without Free Surface Displacement Recovery) (Sheet 4 of 7)

JUNE 13, 1974 NASIRAN 2/173

SYNTHETICAL FLUID

----- N A S I R A N S O U R S E P R O G R A M C O M P I L A T I O N -----

DMAP-DMAP INSTRUCTION
NO.

V.N.NUHLTAV.N.NCKHFL/V.N.NOEED/C.N.123/V.N.NHDE

```

90 SAVE LUSSET.NGLE
91 LULIV G1,GUD/NCEU/GN,GMD/NCEU
92 CRKPT USLID,ITD,LUDYA,TFPUCL,GCD,GWD,SILD,GHLC
93 PAKAM //C,N.ADD/V.N.NEVR/C.N.I/C.N.P
94 PAKAM //C,N.I/V.N.NEFLAFL/C.N.I/C.N.-1
95 UMS MATPDEL,NUPDT,REEXIN,CSTW/BDICCL/V.N.NCKHFL/V.N.NJADFL/V.N.
MEACT
96 SAVE MEACT,NCKHFL,NJADFL
97 PAKAM //C,N.NG/V.N.NEFL/V.N.NJADFL/V.N.NCKHFL
98 PURGE KUFEL/NCKHFL/ADFL/NJADFL
99 CONJ LULFL,NCEU
100 WTRIN, BOP,ICL,EDYN, /AIFL,KUFEL/V.N.LUSET/V.N.NJADFL/V.N.NCKHFL/C.
N.C
101 SAVE NJADFL,NCKHFL
1.1 NATCPP GFL,USLT,SIL,NJFC//C,N.P
1.1 NATCPP GFL,USLT,SIL,NJFC//C,N.P
102 LABEL LULFL3
103 CRKPT ADFL,KUFEL
104 JUMP LULI3
105 LABEL LULI3
106 PURGE PHID,CLANA,JPHID,CGH-CI,OGPHIP,RESCL,JEFCL,CPHIP,SPC, K2PP,
MUPP,L2PP,K2PP,M2UD,HD2UD/NEVER
107 CASE CASLCC,ZCAEEX/C.N.CETUN/V.N.REPEAT/V.N.NJLOUP
108 SAVE REPEAT,NJLOUP
109 CRKPT CASEXX
110 WTRIN CASLXX,MATPDEL,EGDYI,TFPHUL/N2CHF,M2EPP,B2HP/V.N.NJLSETC/V.N.

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Fig. 2.4 Rigid Format 7-DMAP Listing (without Free Surface Displacement Recovery) (Sheet 5 of 7)

CYCLOPHILIC FLUID

MASTMAN SOURCE PROGRAM COMPLETION
UNAP-UNAP INSTRUCTION
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V.C., NOVA INCAZAPPA, A.C./

114 EQU IV K2DPF/NOXMF/ M2DPF,M2PF/NCADFL \$

105 CUYD L3LFL; ARKFL 6

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THE UNIVERSITY OF CHICAGO

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1. The first step in the process is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the problem.

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129 FORGE - X EDDYNHURGH FARM, EDINBURGH, SCOTLAND

THE UNIVERSITY OF CHICAGO

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Fig. 2-4 Rigid Format 7-DMAP Listing (without Free Surface Displacement Recovery) (Sheet 6 of 7)

ANALYTICAL F-1010

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Fig. 2-4 Rigid Format 7-DMAP Listing (without Free Surface Displacement Recovery) (Sheet 7 of 7)

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3. GP1 generates coordinate system transformation matrices, tables of grid point locations, and tables for relating internal and external grid point numbers.
6. GP2 generates Element Connection Table with internal indices.
8. PLTSET transforms user input into a form used to drive structure plotter.
10. PRTMSG prints error messages associated with structure plotter.
13. Go to DMAP No. 17 if no undeformed structure plot request.
14. PLOT generates all requested undeformed structure plots.
16. PRTMSG prints plotter data and engineering data for each undeformed plot generated.
19. GP3 generates Grid Point Temperature Table.
21. TA1 generates element tables for use in matrix assembly and stress recovery.
26. SMA1 generates stiffness matrix $[K_{gg}^x]$ and Grid Point Singularity Table.
28. SMA2 generates mass matrix $[M_{gg}]$.
37. Equivalence $[K_{gg}^x]$ to $[K_{gg}]$ if no general elements.
39. Go to DMAP No. 42 if no general elements.
40. SMA3 adds general elements to stiffness matrix $[K_{gg}^x]$ to obtain stiffness matrix $[K_{gg}]$.
44. GP4 generates flags defining members of various displacement sets (USET) and forms multipoint constraint equations $[R_g] \{u_g\} = 0$.
46. Go to DMAP No. 118 and print error message if no independent degrees of freedom are defined.
48. Equivalence $[K_{gg}]$ to $[K_{nn}]$ and $[M_{gg}]$ to $[M_{nn}]$ if no multipoint constraints.
50. Go to DMAP No. 54 if general elements present.

51. GPSP determines if possible grid point singularities remain.
52. OFP formats table of possible grid point singularities and places it on the system output file for printing.
55. Go to DMAP No. 60 if MCE1 and MCE2 have already been executed for current set of multipoint constraints.
56. MCE1 partitions multipoint constraint equations $[R_g] = [R_m | R_n]$ and solves for multipoint constraint transformation matrix $[G_m] = -[R_m]^{-1} [R_n]$.
58. MCE2 partitions stiffness and mass matrices

$$[K_{gg}] = \begin{bmatrix} \bar{K}_{nn} & K_{nm} \\ K_{mn} & K_{mm} \end{bmatrix} \text{ and } [M_{gg}] = \begin{bmatrix} \bar{M}_{nn} & M_{nm} \\ M_{mn} & M_{mm} \end{bmatrix}$$

and performs matrix reductions

$$[K_{nn}] = [\bar{K}_{nn}] + [G_m^T] [K_{mn}] + [K_{mn}^T] [G_m] + [G_m^T] [K_{mm}] [G_m] \text{ and}$$

$$[M_{nn}] = [\bar{M}_{nn}] + [G_m^T] [M_{mn}] + [M_{mn}^T] [G_m] + [G_m^T] [M_{mm}] [G_m]$$

61. Equivalence $[K_{nn}]$ to $[K_{ff}]$ and $[M_{nn}]$ to $[M_{ff}]$ if no single-point constraints.
63. Go to DMAP No. 66 if no single point constraints.
64. SCE1 partitions out single-point constraints

$$[K_{nn}] = \begin{bmatrix} K_{ff} & K_{fs} \\ K_{sf} & K_{ss} \end{bmatrix} \text{ and } [M_{nn}] = \begin{bmatrix} M_{ff} & M_{fs} \\ M_{sf} & M_{ss} \end{bmatrix}$$

67. Equivalence $[K_{ff}]$ to $[K_{aa}]$ and $[M_{ff}]$ to $[M_{aa}]$ if no omitted coordinates.
69. Go to DMAP No. 74 if no omitted coordinates.

70. SMP1 partitions constrained stiffness matrix

$$[K_{ff}] = \begin{bmatrix} \bar{K}_{aa} & K_{ao} \\ K_{oa} & K_{oo} \end{bmatrix}$$

solves for transformation matrix $[G_o] = -[K_{oo}]^{-1} [K_{oa}]$

and performs matrix reduction $[K_{aa}] = [\bar{K}_{aa}] + [K_{oa}^T] [G_o]$

71. Form the total structure plus fluid gravitational and/or ullage stiffness matrix

$$[K'_{aa}] = [K_{aa}] + [K_{eb}]$$

72. SMP2 partitions constrained mass matrix

$$[M_{ff}] = \begin{bmatrix} \bar{M}_{aa} & M_{ao} \\ M_{oa} & M_{oo} \end{bmatrix}$$

and performs matrix reduction

$$[M_{aa}] = [\bar{M}_{aa}] + [M_{oa}^T] [G_o] + [G_o^T] [M_{oa}] + [G_o^T] [M_{oo}] [G_o] .$$

74. Form the total structure plus fluid mass matrix

$$[M'_{aa}] = [M_{aa}] + [M_{fld}]$$

75. Go to DMAP No. 84 if no free-body supports.

76. RBMG1 partitions out free-body supports

$$[K_{aa}] = \begin{bmatrix} K_{\ell\ell} & K_{\ell r} \\ K_{r\ell} & K_{rr} \end{bmatrix} \text{ and } [M_{aa}] = \begin{bmatrix} M_{\ell\ell} & M_{\ell r} \\ M_{r\ell} & M_{rr} \end{bmatrix}$$

78. RBMG2 decomposes constrained stiffness matrix

$$[K_{\ell\ell}] = [L_{\ell\ell}] [U_{\ell\ell}]$$

80. RBMG3 forms rigid body transformation matrix

$$[D] = -[K_{\ell\ell}]^{-1} [K_{\ell r}]$$

calculates rigid body check matrix

$$[X] = [K_{rr}] + [K_{\ell r}^T]$$

and calculates rigid body error ratio

$$E = \frac{\|X\|}{\|K_{rr}\|}$$

82. RBMG4 forms rigid body mass matrix

$$[m_r] = [M_{rr}] + [M_{\ell r}^T][D] + [D^T][M_{\ell r}] + [D^T][M_{\ell\ell}][D].$$

85. DPD extracts Eigenvalue Extraction Data from Dynamics data block.

87. Go to DMAP No. 116 and print error message if no Eigenvalue Extraction Data.

89. READ extracts real eigenvalues from the equation

$$[K'_{aa} - M'_{aa}] \{u_a\} = 0$$

calculates rigid body modes by finding a square matrix $[\phi_{ro}]$

such that

$$[m_o] = [\phi_{ro}^T][m_r][\phi_{ro}]$$

is diagonal and normalized, computes rigid body eigenvectors

$$[\phi_{ao}] = \begin{bmatrix} D \phi_{ro} \\ -\frac{D \phi_{ro}}{\phi_{ro}} \end{bmatrix}$$

calculates modal mass matrix

$$[m] = [\phi_a^T][M_{aa}][\phi_a]$$

and normalizes eigenvectors according to one of the following user requests:

- 1) Unit value of selected coordinate
 - 2) Unit value of largest component
 - 3) Unit value of generalized mass.
92. OFP formats eigenvalues and summary of eigenvalue extraction information and places them on the system output file for printing.
 94. Go to DMAP No. 120 and exit if no eigenvalues found.
 95. SDR1 recovers dependent components of the eigenvectors

$$\begin{Bmatrix} \phi_o \end{Bmatrix} = [G_o] \begin{Bmatrix} \phi_a \end{Bmatrix}, \begin{Bmatrix} \phi_a \\ \phi_o \end{Bmatrix} = \begin{Bmatrix} \phi_f \end{Bmatrix},$$

$$\begin{Bmatrix} \phi_f \\ \phi_s \end{Bmatrix} = \begin{Bmatrix} \phi_n \end{Bmatrix}, \begin{Bmatrix} \phi_m \end{Bmatrix} = [G_m] \begin{Bmatrix} \phi_n \end{Bmatrix},$$

$$\begin{Bmatrix} \phi_n \\ \phi_m \end{Bmatrix} = \begin{Bmatrix} \phi_g \end{Bmatrix}$$

and recovers single point forces of constraint $\begin{Bmatrix} q_s \end{Bmatrix} = [K_{fs}]^T \begin{Bmatrix} \phi_f \end{Bmatrix}$.

98. Equivalence SIL to SIP and BGPDT to BGPDP when one or more geometric grid points exists.
101. PLTTRAN modifies BGPDT and SIL for functional modules SDR2 and PLOT.
105. SDR2 calculates element forces and stresses (OEF1, OES1) and prepares eigenvectors and single-point forces of constraint for output (OPHIG, PPHIG, OOG1).
106. OFP formats tables prepared by SDR2 and places them on the system output file for printing.

Volume II

- 107a. Calculate the modal stiffness matrix

$$[K_h] = [\phi_a^T] [K'_{aa}] [\phi_a]$$

- 107b. Solve

$$[\omega^2] = [M_I^{-1}] [K_h]$$

- 107c. Calculate the modal pressures (pressure deviations in the general case)

$$[P'_{s\phi}] = [P_{du2}] [\phi_a] [\omega^2]$$

- 107d. Calculate the free surface modal displacements

$$[\phi_1] = [T_{u12}] [\phi_a]$$

- 107e. Print $[\omega^2]$, $[P'_{s\phi}]$, $[\phi_1]$

When recovery of free surface displacements is not desired (107d) and (107e) are replaced by the statement.

- 107e. Print $[\omega^2]$, $[P'_{s\phi}]$

When the gravitational and/or ullage stiffness are included in the analysis the following additional operations are required for complete pressure recovery:

- 107f. Calculate the reduced out modal pressures

$$[P_{f\phi}] = [K_{11}] [\phi_1]$$

- 107g. Calculate the remaining modal pressures

$$[P_{s\phi}] = [C^T] [P_{f\phi}] + [P'_{s\phi}]$$

108. Go to DMAP No. 112 if no deformed structure plots are requested.

109. PLOT generates all requested deformed structure plots.

111. PRTMSG prints plotter data and engineering data for each deformed plot generated.

- 113. Go to DMAP No. 120 and make normal exit.
- 115. NORMAL MODE ANALYSIS ERROR MESSAGE NO. 1 - MASS MATRIX REQUIRED FOR REAL EIGENVALUE ANALYSIS.
- 117. NORMAL MODE ANALYSIS ERROR MESSAGE NO. 2 - EIGENVALUE EXTRACTION DATA REQUIRED FOR REAL EIGENVALUE ANALYSIS.
- 119. NORMAL MODE ANALYSIS ERROR MESSAGE NO. 3 - NO INDEPENDENT DEGREES OF FREEDOM HAVE BEEN DEFINED.

Copies of the ALTER-DMAP statements and the complete DMAP listing for the Rigid Format 3 hydroelastic normal modes analysis are presented in Figs. 2-5 and 2-6, respectively. The corresponding information for the Rigid Format 13 hydroelastic normal modes analysis with differential stiffness is presented in Figs 2-7 and 2-8, respectively.

2.3 PROBLEM DEFINITION AND BULK DATA CONSIDERATIONS

2.3.1 Grid Sequence

The modified NASTRAN hydroelastic technique defined by the altered Rigid Formats requires special purpose bulk data for individual problem definition. The Rigid Format 7 grid set must be ordered according to the following convention:

- (1) generalized free surface pressures, $\{P_f\}$
- (2) generalized structural interface pressures, $\{P_s\}$
- (3) generalized internal pressures, $\{P_i\}$
- (4) discrete free surface displacements, $\{U_f\}$
- (5) harmonic free surface displacements, $\{U_{fh}\}$
- (6) discrete structural displacements, $\{U_s\}$
- (7) harmonic structural displacements, $\{U_{sh}\}$

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N A S T R A N E X E C U T I V E C O N T R O L D E C K E C H O

```

ID=CAP60,COPHULINO
APP DISP
SOL 3,0
TIME 20
DIAG 2
DIAG 7,8,13,14,19,21,22
ALTER 74
ADD MAA,HFLD/MAH $
PARAM //C.N.NOP/V.N.TRUE=-1 $
EQUIV MAH,MAA/TRUE $
CUND MAH09.TRUE $
MATPRN MAH.....// $
LAUDEL MAHNU9 $
ALTER 88
SERMAT KGG,KGG.....//C.N.PRINT
ALTER 91
MATGPR GPL,USET,SIL,PHIA//C.N.A
ALTER 107
SMPLYAD PHIA,KAA,PHIA...../KH/C.N.3/C.N.1/C.N.1/C.N.2/C.N.1 $
SOLVE MJ,KH/WH/C.N.1 $
SMPLYAD PD02,PHIA,MH...../PD2/C.N.3 $
MPYAD TUI2,PHIA,PHF/C.N.0 $
MATPRN MH,PD2,PHF...// $
ENDALTER
CEND

```

{ PD2 represents the negative of the modal pressure
 matrix, add parameter/C, N, -1/for positive
 pressure recovery
 { delete when free surface displacement recovery
 is not desired

Fig. 2-5 Rigid Format 3 ALTER DMAP Statements

AXISYMMETRIC CIRC. CYL. WITH FLUID
HARMONIC REDUCTION

NASTRAN SOURCE PROGRAM COMPLETION
DMAP-DMAP INSTRUCTION NO.

```

1 BEGIN NO.3 NORMAL MODES ANALYSIS - SERIES M $
2 FILE LLL=TAPE $
3 GP1 GEOM1,GEOM2,/GPL,EOEXIN,GPDT,CSTM,BGPDT,SIL/V,N,LUSET/ C,N,
    123/V,N,NOGPDT $
4 SAVE LUSET $
5 CHKPN1 GPL,EOEXIN,GPDT,CSTM,BGPDT,SIL $
6 GP2 GEOM2,EOEXIN/ECT $
7 CHKPN1 ECT $
8 PLTSET PCDR,EOEXIN,ECT/PLTSETX,PLTPAR,GPSETS,ELSETS/V,N,SIL/ V,N,
    JUMPLOT $
9 SAVE NSIL,JUMPLOT $
10 PR1MSG PLTSETX// $
11 SETVAL /V,N,PLTFLG/C,N,1/V,N,PFILG/C,N,0 $
12 SAVE PLTFLG,PFILG $
13 COND PL,JUMPLOT $
14 PLJT PLTPAR,GPSETS,ELSETS,CASECC,BGPDT,EOEXIN,SIL,/PLOTX1/ V,N,
    NSIL/V,N,LUSET/V,N,JUMPLOT/V,N,PLTFLG/V,N,PFILG $
15 SAVE JUMPLOT,PLTFLG,PFILG $
16 PR1MSG PLOTX1// $
17 LABEL PT $
18 CHKPN1 PLTPAR,GPSETS,ELSETS $
19 GP3 GEOM3,EOEXIN,GEOM2,/GPTT/C,N,123/V,N,NOGNV/C,N,123 $
20 CHKPN1 GPTT $
21 TAN, ECT,EPT,BGPDT,SIL,GPTT,CSTM/EST,,GEL,ECT,GPCT/V,N,LUSET/ C,N,
    123/V,N,NOGNV/C,N,0/V,N,NOGNL/V,N,GENEL $
22 SAVE NOGNL,NOSIMP,GENEL $

```

Fig. 2-6 Rigid Format 3 DMAP Listing (Sheet 1 of 6)

APRIL 11, 1974 NASTRAN 5/13/72

AXISYMMETRIC CIRC. CYL. WITH FLUID
HARMONIC REDUCTION

N A S T R A N S O U R C E P R O G R A M C C M P I L A T I O N
DMAP-DMAP INSTRUCTION
NO.

| | | |
|----|--------|---|
| 23 | COND | ERROR1,NDSIMP \$ |
| 24 | PURGE | OGPST/GENEL \$ |
| 25 | CHKPNT | EST,ECPT,GPCT,GEI,UGPST \$ |
| 26 | SMA1 | CSTM,MPT,ECPT,GPCT,DIT/KGGX,GPST/V,N,NOGENL/V,N,NOK4GG \$ |
| 27 | CHKPNT | KGGX,GPST \$ |
| 28 | SMA2 | CSTM,MPT,ECPT,GPCT,DIT/MGG,V,Y,WTMASS=1.0/V,N,NOMLG/V,N,NDRGG/
V,Y,COUPMASS/V,Y,CPBAR/V,Y,CPROD/V,Y,CQUAD1/V,Y,CQUAD2/V,
Y,CPTRI1/V,Y,CPTRI2/V,Y,CPTUBE/V,Y,CPCOPLT/V,Y,CPTRPLT/V,Y,
CPTBSC \$ |
| 29 | SAVE | NOMGG \$ |
| 30 | COND | ERRUR1,NCMGG \$ |
| 31 | CHKPNT | MGG \$ |
| 32 | COND | LGPWG,GRDPNT \$ |
| 33 | GP4G | UGPDT,CSTM,EQE XIN,MGG/OGPWG/V,Y,GRDENT=-1/V,Y,WTMASS \$ |
| 34 | OFF | OGPWG,.....Z/V,N,CARDNO \$ |
| 35 | SAVE | CAROND \$ |
| 36 | LABEL | LGPWG \$ |
| 37 | EQUIV | KGGX,KGG/NOGENL \$ |
| 38 | CHKPNT | KGG \$ |
| 39 | COND | LBL11,NOGENL \$ |
| 40 | SMA3 | GEI,KGGX/KGG/V,N,LUSET/V,N,NOGENL/V,N,NDSIMP \$ |
| 41 | CHKPNT | KGG \$ |
| 42 | LABEL | LBL11 \$ |
| 43 | PARAM | //C,N,MPT/V,N,NSKEP/C,N,D/C,N,0 \$ |
| 44 | GP4 | CASECC,GEOMA,EQE XIN,SIL,GPDT/RG,LUSET/V,N,LUSET/V,N,MPCF1/V,
N,MPCF2/V,N,SINGLE/V,N,OMIT/V,N,REACT/V,N,NSKEP/V,N,REPEAT/
V,N,NDSIMP/V,N,NCL/V,N,NOA \$ |
| 45 | SAVE | MPCF1,MPCF2,SINGLE,OMIT,REACT,NSKEP,REPEAT,MUSET,NOL,NOA \$ |

Fig. 2-6 Rigid Format 3 DMAP Listing (Sheet 2 of 6)

APRIL 11, 1974 NASIRAN 5/13/72

AXISYMMETRIC CIRC. CYL. WITH FLUID
HARMONIC REDUCTION

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N
DNAP-DMAP INSTRUCTION
NU.

```

46 COND      ERROR3,NCL $
47 PURGE      KRR,KLR,DM,MLR,MR/REACT/GM/MPCF1/GO/CHIT/KFS/S INGLE/OG/NDSET $
48 EQUIV      KGG,KNN/MPCF1/MGG,MNN/MPCF1 $
49 CHKPNT     KRR,KLR,DM,MLR,MR,GM,GG,KFS,GG,USET,KAN,MNN $
50 COND      LBL4,GENEL $
51 GPSP       GPL,GPST,LSET,SIL/OGPST $
52 QF>        JGPST.....//V,N,CARDNO $
53 SAVE       CARDNO $
54 LABEL      LBL4 $
55 GOND       LBL2,MPCF2 $
56 MCE1       USET,RG/GM $
57 CHKPNT     GM $
58 MCE2       USET,GM,KGG,MGG...//KAN,MNN... $
59 CHKPNT     KNN,MNN $
60 LABEL      LBL2 $
61 EQUIV      KNN,KFF/SINGLE/MNN,MFF/SINGLE $
62 CHKPNT     KFF,MFF $
63 GOND       LBL3,SINGLE $
64 SCE1       USET,KNN,MNN.../KFF,MFS...MFF... $
65 CHKPNT     KFS,KFF,MFF $
66 LABEL      LBL3 $
67 EQUIV      KFF,KAA/CHIT/ MFF,MAA/CHIT $
68 CHKPNT     KAA,MAA $
69 GOND       LBL5,CHIT $
70 SMP1       USET,KFF.../GO,KAA,KOO,LOC,UOO..... $
    
```

Fig. 2-6 Rigid Format 3 DMAP Listing (Sheet 3 of 6)

APRIL 11, 1974 NASTRAN 5/13/72

AXISYMMETRIC CIRC. CYL. WITH FLUID
HARMONIC REDUCTION

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

DMAP-DMAP INSTRUCTION
NO.

```

71  CKPNT  GO,KVA $
72  SM22   USET,GO,OFF/NA $
73  CKPNT  NAA $
74  LABEL  LBL5 $
74  ADD NAA,NFLD/NAH $
74  PARAM //C,N,NUP/V,N,TRUE=-1 $
74  EQUIV MAH,MAA/TRUE $
74  COND MAHNO9,TRUE $
74  MATPRN MAH,...// $
74  LABEL MAHNO9 $
75  COND  LBL6,REACT $
76  RBMG1  USET,KAA,MAA/KLL,KLR,KPR,KLL,KLR,MRR $
77  CKPNT  KLL,KLR,KRR,KLL,KLR,MRR $
78  RBMG2  KLL/KLL,KLL $
79  CKPNT  ULL,KLL $
80  RBMG3  KLL,KLL,KLR,KRR/DM $
81  CKPNT  DM $
82  RBMG4  DM,KLL,KLR,MRR/MR $
83  CKPNT  43 $
84  LABEL  LBL6 $
85  DPD    DYNAMIC,GPL,SIL,USET,GPLD,SELD,USETD,...,EED,EODYN/V,N,
          -USET/V,N,LLSETD/V,N,NDTFL/V,N,NDELT/V,N,NUPSOUL/V,N,NDTFL/V,
          N,NJNLT/V,N,NDTFL/V,N,NDEED/C,N,123/V,N,NDEUE $
86  SAVE  NDEED $
87  COND  ERROR2,NDEED $
88  CKPNT  EED $

```

Fig. 2-6 Rigid Format 3 DMAP Listing (Sheet 4 of 6)

AXISYMMETRIC CIRC. CYL. WITH FLUID
HARMONIC REDUCTION
APRIL 11, 1974 NASTRAN 5/13/72

```

N A S T R A N   S O U R C E   P R O G R A M   C O M P I L A T I O N
DMAP-DMAP INSTRUCTION
NU.
08 SEENAT MGG,KGG,...//C.N.PRINT
09 READ KAA,MAA,MR,OM,EED,USET,CASECC/LAPA,PHIA,MI,DEIGS/C.N.MODES/V.N.
    NEIGV $
90 SAVE NEIGV $
91 CHKPNT LAMA,PHIA,MI,DEIGS $
91 MATGRP GPL,USET,SIL,PHIA//C.N.A
92 UF3 LAMA,DEIGS,...//V.N.CARDNO $
93 SAVE CARDNO $
94 COND FINIS,NEIGV $
95 SDR1 USET,PHIA,...GO,GM,...KFS,.../PHIG,...OG/C.N.1/C.N.REIG $
96 CHKPNT PHIG,OG $
97 PARAM //C.N.SUB/V.N.SCALAR/V.N.SIL/V.N.LUSEP $
98 EQUIV SIL,SIP/SCALAR/BGPD,SGPD,SGPD/SCALAP $
99 CHKPNT SIP,BGPD $
100 COND LBL7,SCALAR $
101 PLTRAN BGPD,SIL/BGPD,SIP/V.N.LUSEP/V.N.LUSEP $
102 SAVE LUSEP $
103 CHKPNT BGPD,SIP $
104 LABEL LBL7 $
105 SDR2 CASECC,CSTM,MPT,DIT,EOEXIN,SIL,...RGPD,LAPA,OG,PHIG,EST,...,DOGI.
    OPHIG,DESI,DEFI,PPHIG/C.N.REIG $
106 OFI OPHIG,DOGI,DEFI,DESI,...//V.N.CARDNO $
107 SAVE CARDNO $
107 SMPYAD PHIA,MAA,PHIA,.../KH/C.N.3/C.N.1/C.N.2/C.N.1 $
107 SOLVE NE,KH/MH/C.N.1 $
107 SMPYAD PDU2,PHIA,MH,.../PD2/C.N.3 $

```

Fig. 2-6 Rigid Format 3 DMAP Listing (Sheet 5 of 6)

APRIL 11, 1974 NASTRAN 5/13/72

AXISYMMETRIC CIRC. CYL. WITH FLUID
HARMONIC REDUCTION

```

N A S T R A N   S O U R C E   P R O G R A M   C O M P I L A T I O N
DMAP-DMAP INSTRUCTION
NJ.
107 MPYAD TUI2,PHIA.,/PHF/C.N.0.$
107 MATPRN WH,PD2,PHF.,./.$
108 COND P2,JUMPPLOT $
109 PLJIF PLTPAR,GPSETS,ELSETS,CASECC,BGPOT,ECXIN,SIP,PPHIG / PLOTX2/
V.N.NSIL/V.N.LUSET/V.N.JUMPPLOT/V.N.PLTFLG/V.N.PFILE $
110 SAVE PFILE $
111 PRIMSG PLOTX2// $
112 LABEL P2 $
113 JUMP FINIS $
114 LABEL ERROR1 $
115 PRTPARM //C.N.-1/C.N.MODES $
116 LABEL ERROR2 $
117 PRTPARM //C.N.-2/C.N.MODES $
118 LABEL ERROR3 $
119 PRTPARM //C.N.-3/C.N.MODES $
120 LABEL FINIS $
121 END $

**NO ERRORS FOUND - EXECUTE NASTRAN PROGRAM**

```

Fig. 2-6 Rigid Format 3 DMAP Listing (Sheet 6 of 6)

ORIGINAL PAGE IS
OF POOR QUALITY

MAY 4, 1974 NASTRAN 5/13/72

NASTRAN EXECUTIVE CONTROL DECK ECHO

```

ID*AP*00*COUPLING
APP DISP
SOL 13*0
TIME 30
UIAC 5
DIAG 7*0,13,14,19,21,22
ALTER 123
ADD MA*MF*LD*RA*1
PARAM //C*N*NU*V*N*TR*UE=-1
LQU*V MA*NU*9*TH*E
CND MA*NU*9*TH*E
MA*PR*N MA*NU*9*TH*E
LABEL MA*NU*9
ALTER 129
SEEMAT MG3,KHCG,///C*N*PRINT
ALTER 130
SM*Y*AD PH*IA*K*DA*PH*IA,///KH/C*N,3/C*N,1/C*N,1/C*N,2/C*N,1
SHE*Y*AD PH*IA*MA*PH*IA,///MI/C*N,3/C*N,1/C*N,1/C*N,2/C*N,1
S*U*VE MI,KH*W*H/C*N,1
SM*Y*AD PU*2*PH*IA*H*H,///PC*2/C*N,3
HP*Y*AD TU*12*PH*IA*PH*F*Z,C*N,0
MA*PR*N H*P*02*PH*F*Z,///
ENDALTER
END
    
```

{ PD2 represents the negative of the modal pressure matrix, add parameter/C, N, -1/ for positive pressure recovery

{ delete when free surface displacement recovery is not desired

Fig. 2.7 Rigid Format 13 ALTER-DMAP Statements

MAY 4 1974 NASTRAN 5/13/72

ASYMMETRIC CYC. CYL. WITH FLUID
HARMONIC REDUCTION

NASTRAN SOURCE PROGRAM COMPILATION

UNAP-DMAP INSTRUCTION
NO.

```

1 BEGIN      NU.13 NORMAL MODES WITH DIFFERENTIAL STIFFNESS - SERIES M $
2 FILE      ELL-TAPE $
3 GP1       GEOM1.GEOM2/GFL.EOXIN.GPDT.CSTM.BGPDY.SIL/V.V.N.LUSET/ C.N.
            123/V.V.N.NCGPDT $
4 SAVE      LUSET $
5 CHKENT    GPL.EOXIN.GPDT.CSTM.BGPDY.SIL $
6 GP2       GEOM2.EOXIN/ECT $
7 CHKENT    ECT $
8 PLTSET    PGL.EOXIN.ECT/PLTSETX,PLTPAR.GPSETS.ELSETS/V.V.N.SIL/ V.N.
            JUMPPLUT $
9 SAVE      NSIL.JUMPPLUT $
10 PRINTMSG PLTSETX// $
11 SETVAL   //V.V.N.PLTLG/C.N.1/V.V.N.PFILE/C.N.C $
12 SAVE     PLTLG.PFILE $
13 CLND     P1.JUMP/ECT $
14 PLUT     PLTPAR.GPSETS.ELSETS.CASECC.BGPDY.EOXIN.SIL./PLUTX1/ V.N.
            NSIL/V.V.N.LUSET/V.V.N.JUMPPLUT/V.V.N.PLTLG/V.V.N.PFILE $
15 SAVE     JUMPPLUT.PLTLG.PFILE $
16 PRINTMSG PLUTX1// $
17 LABEL    P1 $
18 CHKENT    PLTPAR.GPSETS.ELSETS $
19 GP3       GEOM3.EOXIN.GEOM2/SLT.GPDT/C.N.123/V.V.N.NDGRAV/C.N.123 $
20 CHKENT    SLT.GPDT $
21 TAIL     ECT.ECT.PGPDY.SIL.GPDT.CSTM/EST..GEI.ECPT.GPCT/V.V.N.LUSET/ C.N.
            123/V.V.N.NCGSIMP/C.N.0/V.V.N.NDGENL/V.V.N.GENEL $
22 SAVE     NOSIMP.NCGENL.GENEL $
    
```

Fig. 2-8 Rigid Format 13 DMAP Listing (Sheet 1 of 8)

ORIGINAL PAGE IS
OF POOR QUALITY

TRANSITANCE PROGRAM COMPLETION

UNAP-UNAP INSTRUCTION
NO.

23 CUID ERRUNI, NCSIMP 1

24 PURGE OGPST/GENEL 3

23 CHKPNT EST, ECPT, GPCT, GEL, UGIST S

20 5M4L CSTM,MP,ECPT,GPCT,DIT/KGGA,GPST/V,N,NOGENL/V,N,NJK4GG 9

27 CHANPNT GPSIT,KGCX 3

R2R SMA2
CSIM:MPT:ECPT:GPCT:DIT/MGG/V.V.Y.NTHASS=1-0/V.V.N.NBGG/V.V.N.NBGG/
V.V.V.COUNASS/V.V.Y.CPIAK/V.V.Y.CPHD/V.V.Y.CPOUD1/V.V.Y.CPOUD2/ V.
V.Y.CPTI1/V.V.Y.CPTI2/V.V.Y.CPTUBE/V.V.Y.CPOPLT/V.V.Y.CPTPLT/ V.V.Y.
CPTHESS &

29 SAVE NCMGG 1

30 CHAMPNT AGG 3

31 JUL 1954

URGENT - 1747 25

```

33  GP#6      LGPDT, CSTM, EDX IN, HGG, UGPN, Y, Y, GRDENT=-1/Y, Y, W, MASS, A

```

14-00000 UGPGC.....//V.N.CARDNO 5

DO NOT SAVE CARTRIDGE

150 LABEL LABEL 3

007 EVLIV KGGX, KRS

INVESTMENT \$

49 **LIGHT** **FULLY-INCENT** **\$**

[illegible]

1. **AGENT** - K65

02 LAUREL LHL 11 5.

3. ПАНАМ //С.Н. МРЯ/У.Н. ИСКР/С.Н. О/С.Н. Ч. 8

614 CASECC,CFDMM,EFUXIN,SIL,GPDY/RG,YS,LSH:TV,N,CLSET/V,N,NWPCFI/V,N,NMPCF2/V,N,SINGLE/V,N,UMIT/V,N,HLACT/V,N,NNSHIP/V,N,RTPLAT/V,N,NMPCF1/V,N,NAIL/V,N,NDA

```

MPCF1,MPCF2,SINGLE,OMIT,RLACT,NSKIP,REPEAT,NUSET,NUL,NCA,
SAVE

```

Fig. 2-8 Rigid Format 13 DMAP Listing (Sheet 2 of 8)

MAY 4, 1974 NASTRAN 5/13/72

ALL-JYMLTHIC CIRC. CYL. 4TH FLUID
HARMONIC REDUCTION

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

DMAP-DMAP INSTRUCTION
NU.

```

40 CUND ENRURG,NEA $
47 PARAM //C,N,ANC/V,N,NECR/V,N,SINGLE/V,N,REACT $
48 PUKGE GM/MPCF1/GG,KOG,LON,UUD,PD,UUDV,PUOV/DMIT/PS,KFF,KSS/SINGLE/
    Q5/NUSH $
49 EQUIV KGG,KNN/MPCF1 $
50 CHKPNT GM,KU,GC,KCG,LOG,UUD,PD,UUDV,RUDV,YS,PS,KFS,KSS,UFET,UG,KNN $
51 CUND LHL4D,REACT $
52 JUMP ENRUD2 $
53 LABEL LUL4C $
54 CUND LBL4,GENEL $
55 UPSP GPL,UPST,USET,SIL/UGPST $
56 UFP UGPST,.....//V,N,CAHND $
57 SAVE CARDND $
58 LABEL LBL4 $
59 CUND LUL2,MPCF2 $
60 MCL1 USET,RG/CM $
61 CHKPNT GM $
62 MCL2 USET,GM,KCG,.,/KNN,., $
63 CHKPNT KNN $
64 LABEL LHL2 $
65 EQUIV KNN,KFF/SINGLE $
66 CHKPNT KFF $
67 CUND LUL3,SINGLE $
68 SCEL USET,KNN,.,/KFF,KFS,KSS,., $
69 CHKPNT KFS,NGS,KFF $
70 LABEL LBL3 $

```

Fig. 2-8 Rigid Format 13 DMAP Listing (Sheet 3 of 8)

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

UNMAP-JMAP INSTRUCTION

NUM

```

71 EQUJIV KFF,KAA/CMIT $
72 CHKPNT KAA $
73 COND LUL5,CMIT $
74 SMPI USET,KFF,,,/GU,KAA,KUD,LUD,UUD,..... $
75 CHKPNT GU,KAA,KCG,L00,U00 $
76 LABEL LUL5 $
77 MBNU2 KAA/LLL,ULL $
78 CHKPNT ULL,LLL $
79 SS61 SLT,U00PT,CSTM,SIL,EST,MPT,GPIT,EDT,MCG,CASECC,DIT/PG/ V,N,
      LUSET/C,N,1 $
80 CHKPNT PG $
81 EQUJIV PG,PL/ACSET $
82 CHKPNT PL $
83 COND LUL10,NESET $
84 JS02 USET,GP,YS,KFS,GC,,PG/,PD,PS,PL $
85 CHKPNT PG,PS,PL $
86 LABEL L0L10 $
87 SUBJ LLL,ULL,KAA,PL,LUD,UUD,KUD,PD/ULV,UCCV,RULV,RUDV/V,N,CMT/ V,Y,
      PRES=-1/C,N,1/V,N,EPST $
88 SAVE EPS1 $
89 CHKPNT ULV,U00V,RULV,RUDV $
90 COND LUL9, PRES 1
91 MATGPH WPL,USET,SIL,RUI V//C,N,L $
92 MATGPH GPL,USET,SIL,RUDV//C,N,U $
93 LABEL LUL9 $
94 SMPI USET,PG,ULV,U00V,YS,GO,GM,PS,KFS,KSS,/UGV,PGG,UG/C,N,1/C,N,
      BKLO $

```

Fig. 2-8 Rigid Format 13 DMAP Listing (Sheet 4 of 8)

MAY 9, 1974 NASTPAN 5/13/72

AA15/AMERIC CIRC. CYL. WITH FLUID
HAMMUNIC REDUCTION

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

DMAP-DMAP INSTRUCTION
NO.

```

95 CHKENT JGV.GG.FGG $
96 SUR2 CASECC.CSTM.NPT.OII.EQKIN.SIL.GPII.EDI.BGPDY.PGG.OG.UGV.ESI./
    OPGI.OUGI.CUGVI.OESI.OEFI.PUGVI/C.N.BKLO $
97 UPP OUGVI.OFGI.OUGI.OEFI.OESI./V.N.CARDNO $
98 SAVE CARDNO $
99 CLND P2.JUMPELUT $
100 PLUT PLTPAR.GFSETS.ELSETS.CASECC.BGPDY.EQKIN.SIL.PUGVI./PLCTX2/V.N.
    NSIL/V.N.LUSET/V.N.JUMPELUT/V.N.PLTFLG/V.N.PFILE $
101 SAVE PFILE $
102 PRMSG PLCTX2// $
103 LABEL P2 $
104 DSGI CASECC.GFTT.SIL.FCT.UGV.CSTM.NPT.ECPT.GPCT.DIF/KDGG/
    USCUBET $
105 CHKENT KUGG $
106 ADU KOGG.KGG/KEGG $
107 EQUIV KGGG.KDNN/MPCF2 / MGG.MNN/MPCF2 $
108 CHKENT KDNN.MNN $
109 CLND LBL2D.MPCF2 $
110 MCE2 USET.GM.KRGG.MGG./KDNN.MNN.. $
111 CHKENT KDNN.MNN $
112 LABEL LUL2U $
113 EQUIV KDNN.KDFF/SINGLE / MNN.MFF/SINGLE $
114 CHKENT KUFF.MFF $
115 CLND LBL3D.SINGLE $
116 SCL1 USET.KDNN.MNN./KOFF.KDFS.MFF.. $
117 CHKENT KOFF.KDFS.MFF $
118 LABEL LBL3C $

```

Fig. 2-8 Rigid Format 13 DMAP Listing (Sheet 5 of 8)

145 KING
EMERSON AVE 100 5

Fig. 2-8 Rigid Format 13 DMAP Listing (Sheet 6 of 8)

MAY 4. 1974 NASTRAN 5/13/72

AXISYMMETRIC CIRC. CYL. WITH FLUID
HARMONIC REDUCTION

NASTRAN SOURCE PROGRAM COMPILATION
UNAP-UNAP INSTRUCTION
NU.

```

136 SUR1 USET,,PHIA,,GG,GM,,NDFS,,/PHIG,,RUG/C,N,1/C,N,RK11 $
137 CHKPT PHIG,BOE $
138 SUR2 CASECC,CSTV,MPT,CIT,EDEXIN,SIL,,RGPD1,LAMA,DUG,PHIG,EST,/ $
      URG1,OPTIC,UBES1,UBEF1,PPHIS/C,N,RK11 $
139 OFP UPHIG,CECCI,URF1,QUE51,,//V,N,CARDNG $
140 SAVE CARND $
141 SUR3AD PHIA,KERA,PHIA,,/KH/C,N,3/C,N,1/C,N,2/C,N,1 $
142 SUR3AD PHIA,NAA,PHIA,,/MI/C,N,3/C,N,1/C,N,1/C,N,2/C,N,1 $
143 SOLVE MI,KH//P/C,N,1 $
144 SUR3AD PUG2,PHIA,WH,,/DE2/C,N,3 $
145 MPYAD TUI2,PHIA,,/PH/C,N,0 $
146 MATPRN WH,PUG2,PTF,// $
147 CUND P3,JUNPPLOT $
148 PLAT PLTPAR,CPSE1,S,E,SETS,CASECC,DGPD1,EDEXIN,SIL,,PPHIG/PL,CTK3/V,N,
      NSIL/V,N,LUSET/V,N,JUMPLUT/V,N,PLTFLG/V,N,PH1E $
149 SAVE PH1E $
150 PNTMSG PLUTK3// $
151 LABEL P3 $
152 JUNK FINIS $
153 LABEL ERRUM1 $
154 PREPARM //C,N,1/C,N,BUCKLING $
155 LABEL ENRUR2 $
156 PREPARM //C,N,2/C,N,BUCKLING $
157 LABEL ENRUR3 $
158 PREPARM //C,N,3/C,N,BUCKLING $
159 LABEL ENRUR4 $

```

Fig. 2-8 Rigid Format 13 DMAP Listing (Sheet 7 of 8)

ORIGINAL PAGE IS
OF POOR QUALITY

MAY 4. 1974 NASTRAN 5/13/72

AXISYMMETRIC CYL. WITH FLUID
HARMONIC REDUCTION

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

DMAP-DMAP INSTRUCTION

NJ.

154 PRTPARM //C,N,-4/C,N,-BUCKLING \$

155 LABEL ERRORS \$

156 PRTPARM //C,N,-5/C,N,-BUCKLING \$

157 LABEL ERRORS \$

158 PRTPARM //C,N,-6/C,N,-BUCKLING \$

159 LABEL FINIS \$

160 END \$

NO ERRORS FOUND - EXECUTE NASTRAN PROGRAM

Fig. 2-8 Rigid Format 13 DMAP Listing (Sheet 8 of 8)

When free surface displacement recovery is not desired, categories (4) and (5) are absent. Although the external grid indexing, I_E , is such that the generalized pressures (1), (2) and (3) are of lowest indices, the NASTRAN internal indices for the pressures I_I , are:

$$I_I = 1,000,000 \times I_n + I_E$$

where

$$I_n = N+1 \text{ for a cosine series}$$

$$I_n = N+1/2 \text{ for a sine series}$$

In order to avoid conflicting indices and to accommodate partitioning operations, external grid index bounds must be strictly adhered to (Note: external and internal indices for displacements are equivalent). The chosen external index bounds are:

$$1 \leq I_E (P_S, P_f, P_I) \leq 999$$

$$1000 \leq I_E (U_f, U_{f_h}) \leq 2999$$

$$3000 \leq I_E (U_S) \leq 9999$$

$$10,000 \leq I_E (U_{S_h}) \leq 999,000$$

The above sequencing bounds also hold for U_S and U_{S_h} in Rigid Formats 3 and 13 for modal hydroelastic analysis.

2.3.2 Coordinate Systems

The most convenient displacement set coordinate systems for hydroelastic problems are local spherical or cylindrical reference frames in which one of the linear displacements is normal to the fluid bounding surface and the other two linear displacements are tangent to bounding surface; such reference frames are also ideal for structural grid points defining the surface of a plate or shell not interfacing with a fluid. In the case of the free surface, when displacement recovery is desired, a cylindrical reference frame with the $i_3(z)$ displacement component directed normal to the free surface should be defined.

Typical reference frames with defining parameters are illustrated in Fig. 2-9.

2.3.3 Constraints and Reductions

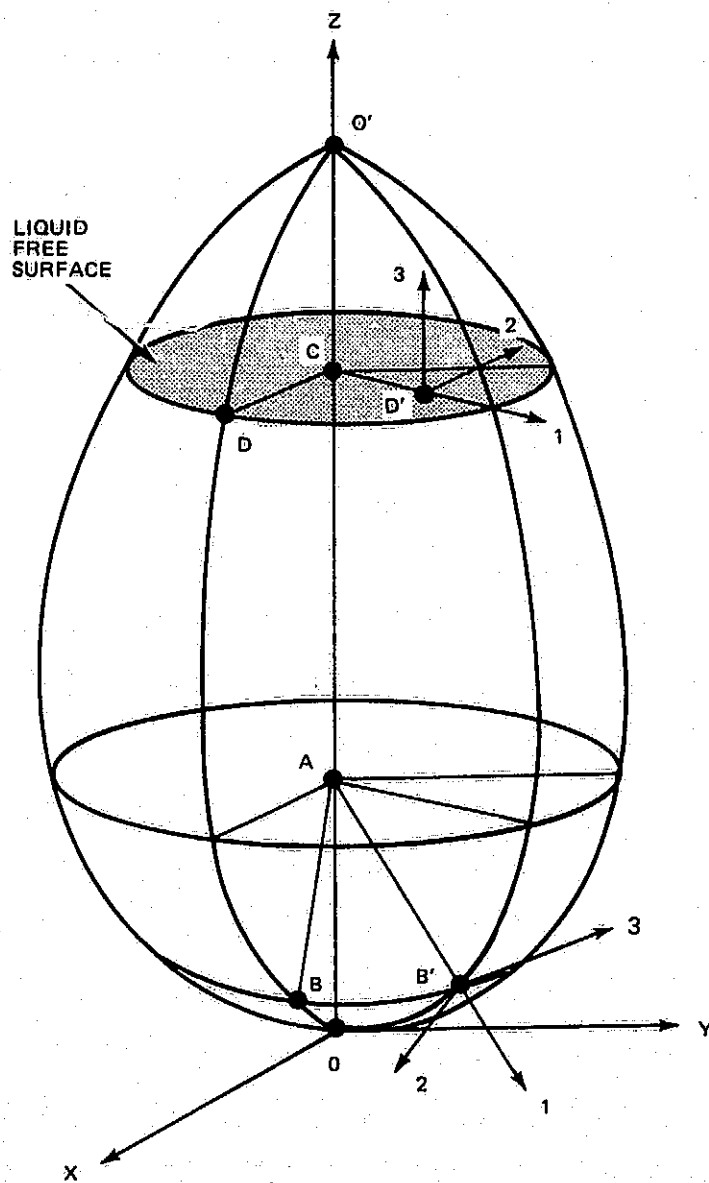
The required and recommended constraints in the Rigid Format 7 fluid data calculation and Rigid Format 3 or 13 hydroelastic normal modes analysis follow differing rules due to the special purpose of each respective calculation. The final analysis sets, however, must be compatible. The definition of local spherical and cylindrical reference frames described in Section 5.3.2 plays a crucial role in the considerations outlined below.

The constraints and reductions applied in the Rigid Format 7 fluid data calculation are:

- Multipoint Constraints (MPC) - The multipoint constraints are used for harmonic transformation of discrete free surface and structural displacements. Only the displacement components to be retained in the analysis set should be transformed (e.g., outward normal only, normal and tangential only). As a general rule only those free surface displacements normal to the surface are transformed.
- Single Point Constraints (SPC) - The single point constraint set includes all structural displacements (Harmonic or discrete) to be omitted by Guyan reduction in the Rigid Format 3 or 13 modal analysis; components normal to the fluid/structure interface should not be constrained. It should be noted that there is no structural stiffness matrix to be decomposed in the Rigid Format 7 calculation. Single point constraints defining physical structural constraints are included in the SPC set.

In the cases where fluid free surface displacement sets are not defined, the free surface pressures become members of the SPC set; in addition, for intermediate fluid fill conditions the pressures above the intermediate free surface become members of the SPC set.

- Guyan Reduction (OMIT) - The OMIT set must include all fluid internal pressures. Structural displacements may not appear in this set since the structural stiffness matrix is not defined in Rigid Format 7.



- FREE SURFACE CYLINDRICAL REF. FRAME DEFINED BY LOCATION OF POINTS C , O' , D
- LOCAL SPHERICAL REF. FRAME DEFINED BY LOCATION OF POINTS A , O' , B WHERE LINE AB DEFINES A NORMAL W.R.T. THE STRUCTURAL SURFACE.

Fig. 2-9 Local Reference Frames

- Special Partitioning - A partitioning vector, $\{P_9\}$ is defined by DMI statements to partition the analysis set into generalized pressure and generalized displacement subsets. If fluid free surface displacements have not been defined in the formulation, further partitioning is not required.

When fluid free surface displacements are defined partitioning of the pressure and displacement subsets is required. The vector $\{G_9\}$ is defined by DMI statements to partition the pressure subset into free surface pressure and structural interface pressure subsets. The vector $\{UP\}$ is defined to partition the displacement subset into free surface and structural displacement subsets. It should be noted that the structural displacement subset corresponds to the Rigid Format 3 analysis set to be defined below.

The constraints and reductions applied in the Rigid Format 3 or 13 hydroelastic normal modes analyses are:

- Multipoint Constraints (MPC) - The multipoint constraints are used for harmonic transformation of discrete structural displacements if harmonic reduction is utilized. All six displacement degrees of freedom must be transformed for each grid point associated with the harmonic constraints. Additional multipoint constraints not associated with the harmonic transformation may also be defined.
- Single Point Constraints (SPC) - Single point constraints are utilized to define structural supports on harmonic as well as discrete displacements as required.
- Guyan Reduction (OMIT) - The OMIT set includes harmonic displacement components to be reduced out (e.g., tangential displacements and rotations). Discrete displacement components are also members of this set as required.

2.3.4 Special Bulk Data Considerations

The bulk data required in the modified Rigid Format 7 calculation of fluid matrix data closely follows the unmodified Rigid Format 7 bulk data with a few exceptions.

These are:

- (1) A free surface may not be defined in terms of FSLIST. If free surface displacement recovery is required (or gravitational stiffness is included)

the free surface is defined as part of the BDYLIST. If free surface displacement recovery is not desired the BDYLIST only includes the fluid points at the structural interface.

- (2) A dummy EIGC card is required to avoid an error message.
- (3) A PARAM card is required with the following data:

Field 1 = PARAM

Field 2 = A999

Field 3 = N (floating point number)

Field 4 = 0.

Where N is equal to the number of symmetric sections of structural boundary about the fluid circumference being modeled by structural elements.

- (4) The partitioning vectors $\{P_9\}$, $\{G_9\}$ and $\{UP\}$ must be defined on DMI cards as described in Section 5.3.3.

The fluid matrix output from the Rigid Format 7 run may be placed on cards or tape. If it is output onto DMI cards, these cards must be used as part of the input data for a Rigid Format 3 or 13 hydroelastic normal modes analysis run. The remaining bulk data for the hydroelastic normal modes analysis is the same as for a dry structure.

3 - 1/8-SCALE SPACE SHUTTLE EXTERNAL TANK HYDROELASTIC ANALYSIS

An investigation of 1/8-scale external tank dynamics in a free-free supported condition utilizing the modified versions of Rigid Formats 7 and 3 has been undertaken. The finite element hydroelastic model illustrated in Figs. 3-1 through 3-4 is described by a grid set consisting of 348 pressure degrees of freedom, 2,058 structural degrees of freedom, and 768 harmonic structural degrees of freedom. The structural model contains elements representing all rings, stringers, internal stiffening members and asymmetries present in the 1/8-scale test article. Normal and tangential motion of the tank surface is conveniently described in terms of local spherical and cylindrical reference frames.

The fluid model describing the dynamics of the fluids consists of 204 and 144 degrees of freedom for the LOX and LH₂ model fluids, respectively, in the liftoff condition; harmonics $n = 0, 1, 2, 3$ were chosen to describe asymmetric dynamics with the pitch plane taken as an axis of symmetry. The respective LO₂ and LH₂ free surface motions in this application were not desired. Free surface displacement sets are therefore not defined, however the fluid free surface condition is described in Rigid Format 7 by application of single point constraints (SPC's) on free surface pressures. In addition, for liquid levels other than the liftoff condition, single point constraints are applied to pressure degrees of freedom at and above the appropriate free surfaces. This feature of the analysis provides capability for study of many liquid fill conditions utilizing a single grid set fluid model.

Harmonic reduction retaining harmonics $n = 0, 1, 2, 3$ was applied to the structural grid of the external tank (ET) for consistency with the fluid pressure grid. The multipoint constraint data for this study was generated by a general purpose data preparation program HARM which is discussed in Appendix A. Since consistency is desirable mainly at the fluid/structure interface, the harmonic transformation was limited to the interface points associated with the liftoff condition. Many of the remaining grid set displacements were "omitted" by Guyan reduction. In addition, in the basic analysis, all generalized rotations and tangential displacements in the harmonic set of displacements were "omitted". The analysis set of displacements therefore consists of 128 harmonic, outward normal displacement degrees of freedom (32 meridional locations, harmonics $n = 0, 1, 2, 3$).

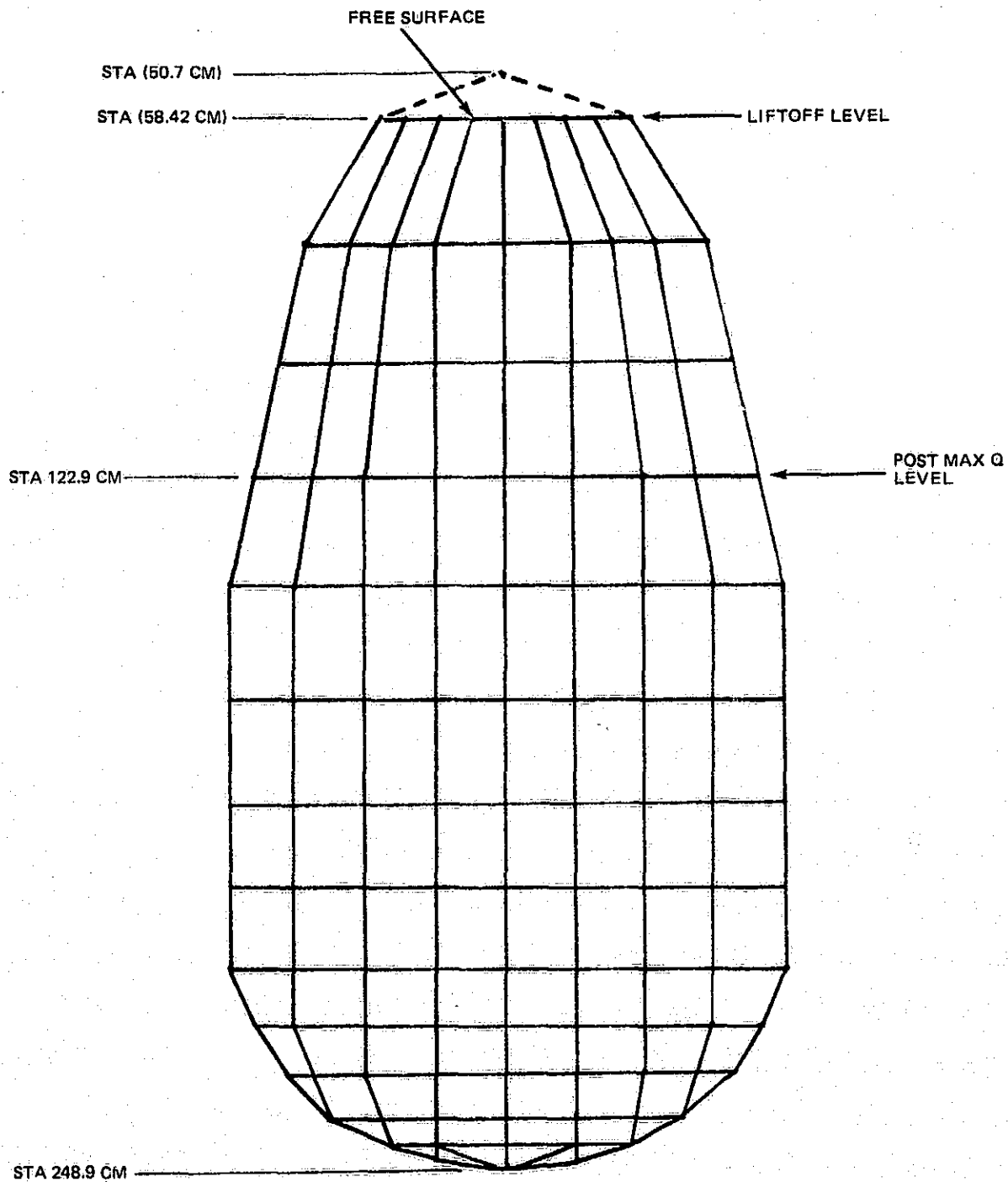


Fig. 3-1 LO₂ Fluid Idealization (Rings)

II

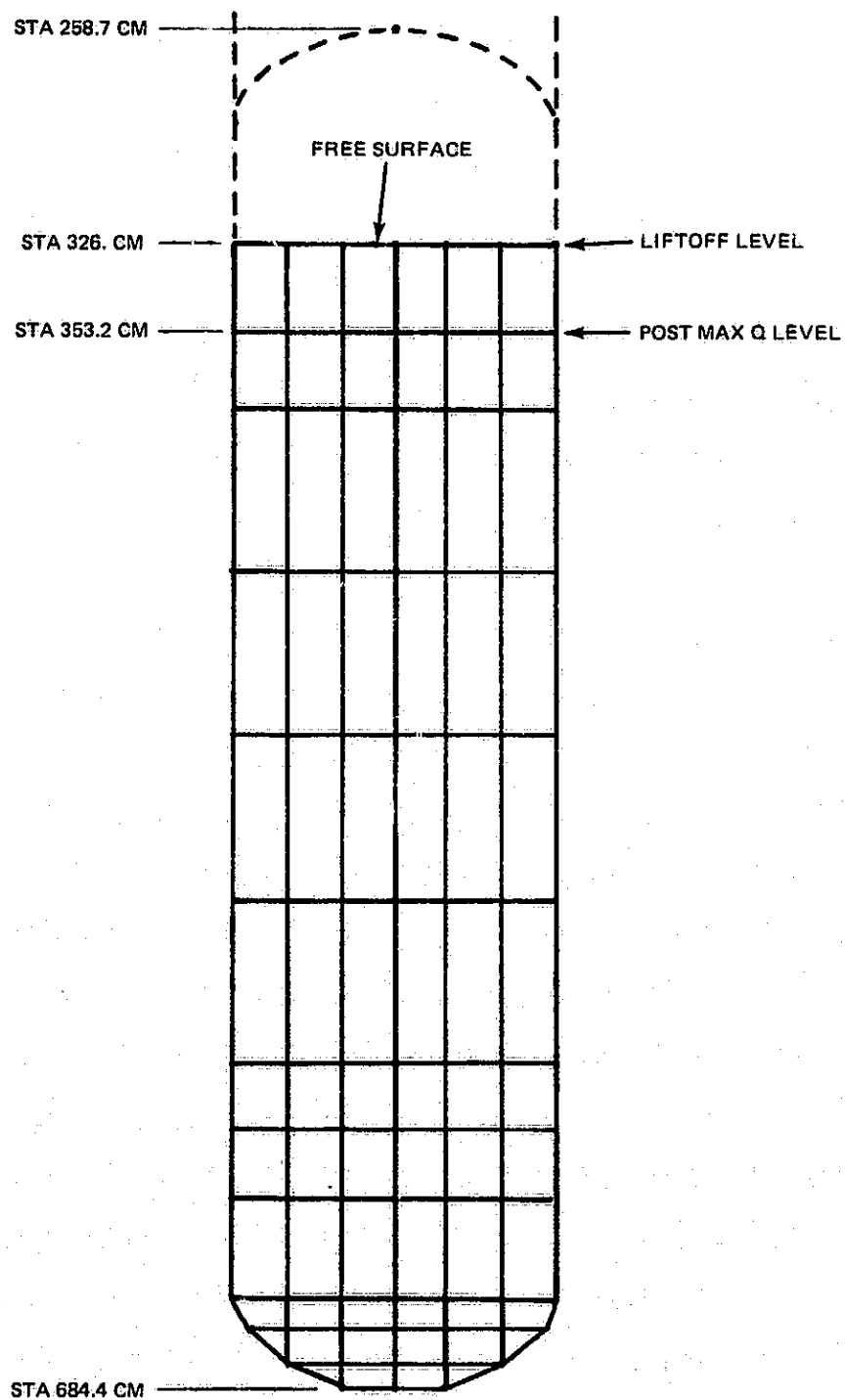


Fig. 3-2 LH₂ Fluid Idealization (Rings)

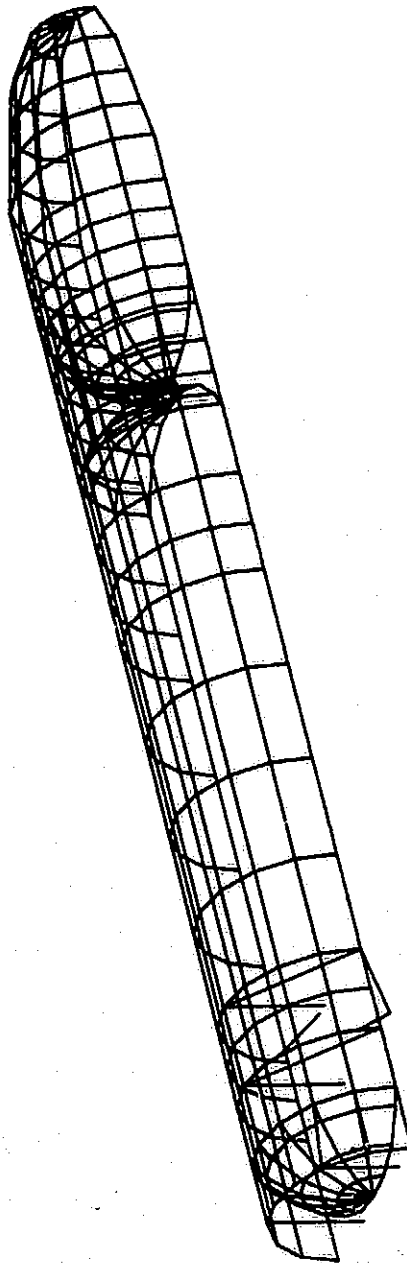


Fig. 3-3 1/8-Scale External Tank Structural Grid

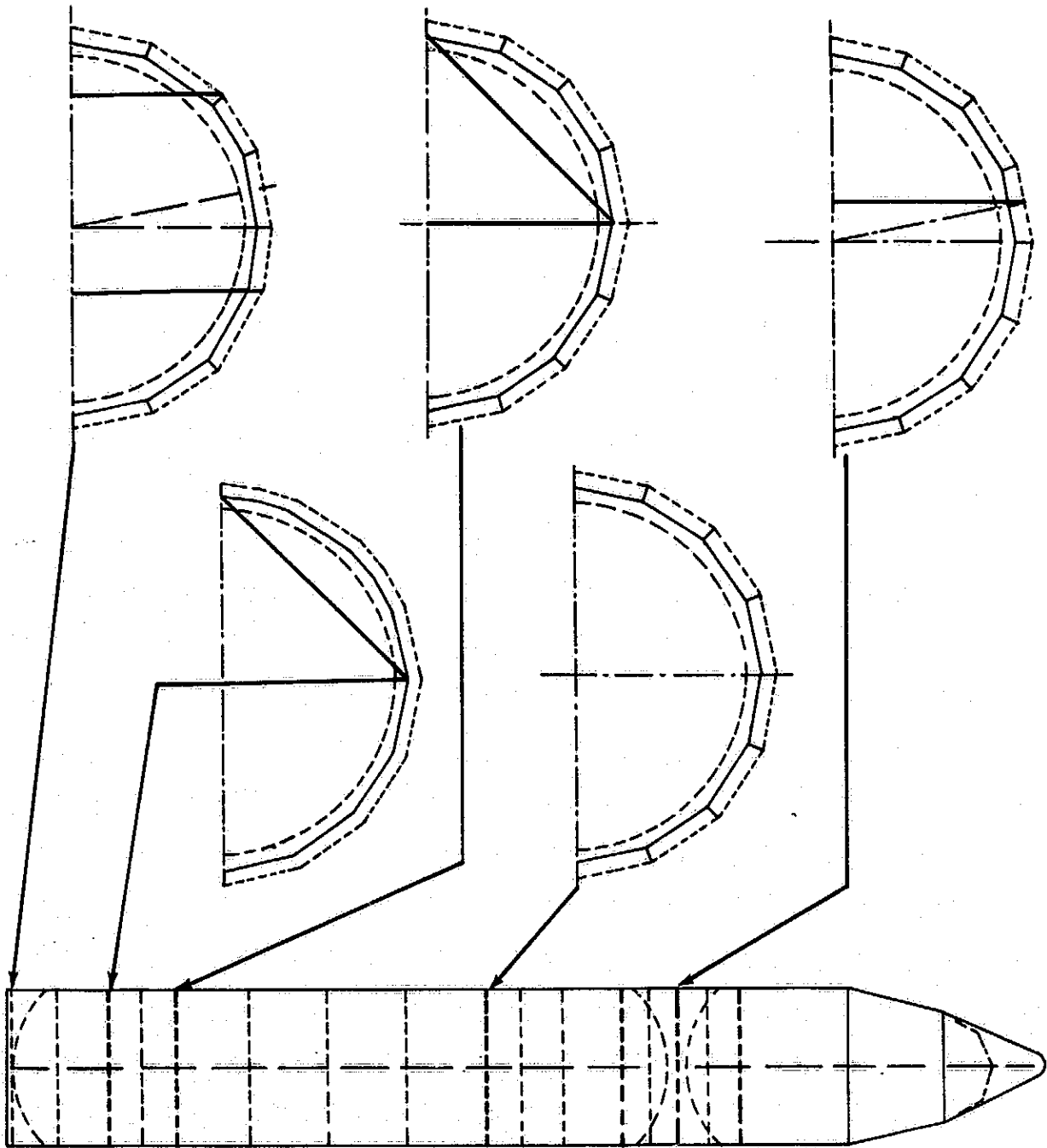


Fig. 3-4 1/8-Scale External Tank Heavy Frame Idealizations

Volume II

Three liquid fill conditions have been studied consisting of liftoff, post max Q and empty. In terms of liquid height above the respective bulkheads the conditions are identified as:

- liftoff: $h_{\text{LOX}} = 190.5 \text{ cm}$, $h_{\text{LH}_2} = 358.14 \text{ cm}$
- post max - Q: $h_{\text{LOX}} = 127 \text{ cm}$, $h_{\text{LH}_2} = 330.2 \text{ cm}$
- empty: $h_{\text{LOX}} = h_{\text{LH}_2} = 0$

The liquid free surfaces are normal to the tank axis since the NASTRAN hydro-elastic analysis is currently limited to axisymmetric fluid configurations.

Normal modes analysis for each of the fill conditions was performed with the modified version of Rigid Format 3. All 128 eigenvalues and 25 mode shapes and modal pressure distributions were extracted by the Given's method. Computational efficiency was quite satisfactory for this rather complex mathematical model. Computation time on the Grumman IBM 370/165 computer for the fluid mass and pressure recovery matrices (LOX and LH₂ combined) on Rigid Format 7 was on the average slightly less than 5 CPU minutes per liquid level and computation time for normal modes analysis in Rigid Format 3 was on the average about 18 CPU minutes per liquid level (16 min. computation, 2 min. plot preparation). In previous attempts to study the dynamics of the same finite element representation with the standard NASTRAN hydroelastic analysis, computation times were in excess of 70 CPU minutes with only one eigenvalue and mode shape extracted by the unsymmetric inverse power method. Actually the computation time for normal modes analysis can be significantly reduced by utilization of NASTRAN's checkpoint-restart capability. By utilization of checkpointing in a first case liquid level NASTRAN run, structural and fluid data may be saved on tapes eliminating much of the computation time associated with preparation of matrix data common to all liquid levels (especially reduction of the structural model representation), total computation time per liquid level may be reduced to about 10 CPU minutes for cases subsequent to the initial run.

Modal data for each of the three fill conditions studied are summarized in Tables 3-1 through 3-3 with dome pressure gain presented as a measure of relative significance in Pogo susceptibility. The pressure gain is defined as the dome pressure

(LO₂ and LH₂) in the vicinity of the feedline interface resulting from a unit modal acceleration. Plots of the mode shapes are presented in Figs. 3-5 through 3-8. Unrealistic behavior of the individual tank dome apexes is present in the liftoff configuration illustrated in Figs. 3-5 through 3-26 and in the post max Q configuration illustrated in Figs. 3-27 through 3-31. This localized behavior was eliminated by incorporation of an "apex fix" in the post max Q configuration illustrated in Figs. 3-32 through 3-53 and in the empty configuration illustrated in Figs. 3-54 through 3-75 with negligible effect on natural frequencies and overall mode shapes. The "apex fix" consists of a set of multipoint constraints (MPC's) forcing the apex and the set of grid points connected to it by triangular elements to move as a rigid body in the zeroth harmonic as shown in Fig. 3-76.

An assessment of the accuracy of the current NASTRAN analysis results was made on the basis of available test and previous analysis data. Comparisons of the current results with limited test, previous NASTRAN finite element, and NASTRAN equivalent beam model results are presented in Table 3-4. For the liftoff condition, the current and previous NASTRAN first axial mode frequencies are in disagreement. This is attributed to the extreme Guyan reduction required in the previous analysis to keep computation time at a reasonable level. Test data for the liftoff condition is not available at the present time. In the case of the post max Q fill condition, limited test results are available with some uncertainty in the second overall bending frequency. Excellent agreement between current NASTRAN finite element and test frequencies in the first axial mode and poor agreement in the respective bending frequencies were noted; the bending mode discrepancy is also present in the empty condition results. An effort to locate the source of discrepancy was initiated. The present first bending mode and n = 3 shell mode of the LH₂ cylinder presented in Figs. 3-54 and 3-55 respectively, compared well with the previous NASTRAN results (see Table 3-4). No comparisons were made with the third empty External Tank mode calculated in the previous analysis since this mode is predominantly an n = 4 shell mode and the current analysis is limited to the harmonics n = 0, 1, 2, 3.

A comparison of the current NASTRAN and test firing bending frequencies in the empty condition indicates a frequency error

$$\frac{\omega_{\text{Test Empty}}}{\omega_{\text{Anal Empty}}} = \frac{89}{105.6} = 0.8428 \quad (3-1)$$

which applied as a correction to the post max Q first bending frequency results in

$$\omega \text{ corrected} = 0.8428 \times 49.2 \text{ Hz} = 41.5 \text{ Hz} \quad (3-2)$$

which is much closer to the test result, 37 Hz. This leads one to suspect strongly that an inaccuracy exists in the structural finite element model. A series of modifications in the structural model were implemented in search of sources of error. In one case, the large elements on the LH₂ tank cylinder were converted from CQUAD2 membrane-plate elements to CQDMEM membrane elements since it was suspected that individual plate bending strain energy was unrealistically high; the results of the study showed no change in the fundamental bending mode frequency.

In another attempt to find the source of inaccuracy, ring frame torsional and axial stiffnesses were reduced to reflect partial effectiveness in the axial direction; again there was no change in the fundamental bending mode frequency. At this point the effort to locate the discrepancy was halted because further effort was considered to be outside the scope of the present task.

In order to verify the fluid model, modal pressure distributions in the first axial and bending modes for the post max Q fill conditions were studied; the pressure distributions are illustrated in Figs. 3-77 and 3-78. Since nearly all of the system mass is associated with the fluids, the pressure distributions in the free-free supported modes must reflect an overall state of equilibrium. This condition is apparent in the axial ($n = 0$) pressure distributions by the nearly equal and opposite bulkhead pressures (note that a small $n = 0$ pressure contribution appears in the bending mode since the tank structure is not purely axisymmetric). In the bending mode the net lateral force and pitch moment are nearly zero; thus confidence is gained in the fluid representation in the lower mode shapes. Further verification of the fluid representation in the higher modes is effected by examination of pressure distributions in the LOX tank in the post max Q fill condition illustrated in Fig. 3-79; it is noted that the pressure and displacement profiles below the level of the free surface have similar shapes with nearly coincident vibration nodes. In addition, pressure distributions near the free surface in all lateral pressure distributions ($n \geq 1$) approach zero pressure indicating the "effective slosh mass" contributions which are out of phase with shell motion in the hydroelastic frequency range. Further quantitative checks were made by hand computation of modal generalized mass of the

fluid on the basis of pressure distributions which compared well with approximated modal mass values based on a NASA LaRC beam model and with the NASTRAN computed modal mass. With verification of the fluid representation fairly complete, a checkout of the structural model was initiated.

An initial verification of the accuracy of the harmonic reduction scheme applied the structurally asymmetric tank was made by comparison of the current empty tank results with previous NASTRAN results for the same finite element model without any reductions. Only three modes were obtained by the inverse power method in the previous analysis and these are presented in Figs. 3-80 through 3-82.

In the event that the reader wishes to review and/or revise the 1/8-scale external tank mathematical model, he must be aware of the fact that some shell grid point displacements are not expressed in terms of local cylindrical or spherical reference frames. Thus displacements associated with shell grid points 8134, 8352, 8355 must not be related to the harmonic displacement set; it should also be noted that any grid point displacements not associated with shell surface motion may not be related to the harmonic set.

Table 3-1 1/8-Scale External Tank Hydroelastic Mode Summary (Post Max Q)

| Mode No. | Freq. (Hz) | Modal Mass | Description of Mode | LOX Dome Pressure Gain X 10 ³ | LH ₂ Dome Pressure Gain X 10 ³ |
|----------|------------|------------|--------------------------------|--|--|
| 4 | 42.0 | .549 | LOX n=2 (No Dome) | 0.013 | 0.009 |
| 5 | 45.5 | .294 | LOX n=3 (No Dome) | 0.007 | 0.006 |
| 6* | 49.2 | .427 | ET 1st Bending n=1 | 0.078 | 0.074 |
| 7* | 51.8 | 1.809 | ET 1st Axial n=0 | 0.124 | 0.106 |
| 8 | 58.6 | .140 | LH ₂ Cylinder n=2,3 | 0.006 | 0.005 |
| 9* | 61.7 | .074 | LH ₂ Cylinder n=3,2 | 0.019 | 0.015 |
| 10* | 79.2 | 1.158 | ET 2nd Axial n=0 | 0.082 | 0.040 |
| 11* | 79.7 | 1.135 | ET 2nd Bending n=1 | 0.111 | 0.016 |
| 12 | 105.7 | .359 | LOX n=2 (No Dome) | 0.003 | 0.001 |
| 13 | 107.8 | .177 | LOX n=3 (No Dome) | 0.005 | 0.001 |
| 14* | 113.7 | .244 | LOX n=0 | 0.422 | 0.005 |
| 15* | 120.7 | .160 | LOX n=1, ET n=1 | 0.412 | 0.003 |
| 16* | 120.9 | .346 | LOX n=0 | 0.198 | 0.033 |
| 17 | 125.5 | .126 | LH ₂ Cylinder n=3,2 | 0.006 | 0.002 |
| 18 | 130.6 | .106 | LH ₂ Cylinder n=3,2 | 0.013 | 0.002 |
| 19 | 144.6 | .396 | LOX n=2 | 0.015 | 0.009 |
| 20* | 146.2 | .125 | LOX n=1 | 0.401 | 0.015 |
| 21* | 148.6 | .338 | LOX n=0 | 0.194 | 0.001 |
| 22 | 149.1 | .211 | LOX n=3 (No Dome) | 0.005 | 0.018 |
| 23* | 150.6 | .283 | ET Bending, LOX Dome n=1 | 0.128 | 0.001 |
| 24* | 162.9 | .089 | LOX n=2 | 0.141 | 0.273 |
| 25* | 167.8 | .079 | LOX Dome, ET n=0 | 0.662 | |

*Denotes Pogo Sensitive Mode

Table 3-2 1/8-Scale External Tank Hydroelastic Mode Summary (at Liftoff)

| Mode No. | Freq. (Hz) | Modal Mass | Description of Mode | LOX Dome Pressure Gain X 10 ³ | LH ₂ Dome Pressure Gain X 10 ³ |
|--|------------|------------|-------------------------------------|--|--|
| 4* | 29.7 | 4.751 | ET 1st Axial n=0 | 0.130 | 0.034 |
| 5 | 34.5 | 0.857 | LOX n=2 (No Dome) | 0.003 | 0.001 |
| 6* | 35.7 | 0.760 | ET 1st Bending n=1 | 0.040 | 0.017 |
| 7 | 36.6 | 0.428 | LOX n=3 (No Dome) | 0.008 | 0.005 |
| 8* | 54.9 | 2.667 | ET 2nd Axial n=0 | 0.067 | 0.091 |
| 9* | 57.8 | 0.131 | LH ₂ Cylinder n=2,3 | 0.016 | 0.019 |
| 10* | 61.4 | 0.067 | LH ₂ Cylinder n=3,2 | 0.018 | 0.034 |
| 11 | 62.1 | 0.395 | LOX n=3 (No Dome) | 0.011 | 0.005 |
| 12* | 63.8 | 0.520 | ET 2nd Bending n=1 | 0.070 | 0.006 |
| 13 | 68.4 | 0.581 | LOX n=2 (No Dome) | 0.002 | 0.003 |
| 14* | 96.0 | 0.518 | LOZ n=1 | 0.102 | 0.001 |
| 15* | 96.1 | 0.433 | LOX n=0 | 0.302 | 0.006 |
| 16* | 109.4 | 0.455 | LOX, LH ₂ n=0 | 0.155 | 0.028 |
| 17 | 114.5 | 0.741 | LOX, LH ₂ n=2,3 | 0.009 | 0.001 |
| 18 | 117.8 | 0.277 | LOX n=3 (No Dome) | 0.006 | — |
| 19* | 119.7 | 0.142 | LH ₂ Cylinder, LOX n=2,0 | 0.085 | 0.002 |
| 20* | 119.8 | 0.254 | LOX n=0 | 0.276 | 0.017 |
| 21* | 124.2 | 0.221 | LOX n=1 | 0.253 | 0.003 |
| 22 | 128.6 | 0.062 | LH ₂ Cylinder n=3 | 0.002 | 0.001 |
| 23* | 135.0 | 0.475 | LOX n=0 | 0.150 | 0.25 |
| 24* | 135.9 | 0.431 | ET, LOX Dome n=1,0 | 0.194 | 0.005 |
| 25 | 138.2 | 0.589 | LOX n=2 | 0.006 | 0.002 |
| * Denotes Pogo Sensitive Mode | | | | | |
| NOTE: Modes 1, 2, 3 are Rigid Body Pitch Plane Modes | | | | | |

Table 3-3 Empty 1/8-Scale External Tank Mode Summary

| Mode No. | Freq. (Hz) | Modal Mass | Description of Mode |
|----------|------------|------------|--------------------------------------|
| 4 | 105.6 | 0.0425 | ET 1st Bending n=1 |
| 5 | 153.0 | 0.0094 | LH ₂ Cylinder n=3 |
| 6 | 161.7 | 0.0172 | LH ₂ Cylinder n=2,3 |
| 7 | 226.0 | 0.0497 | ET 2nd Bending n=1 |
| 8 | 257.8 | 0.0770 | ET 1st Axial n=0 |
| 9 | 274.7 | 0.0271 | LH ₂ Cylinder n=2, 3 |
| 10 | 328.3 | 0.0122 | LH ₂ Cylinder, LOX n=3, 2 |
| 11 | 332.0 | 0.0149 | LOX, LH ₂ n=3,2 |
| 12 | 332.8 | 0.0234 | LOX, LH ₂ n=3,2 |
| 13 | 343.7 | 0.0118 | ET n=3 |
| 14 | 357.8 | 0.0696 | ET Bending n=1,3 |
| 15 | 431.0 | 0.0210 | LH ₂ Cylinder n=2 |
| 16 | 459.1 | 0.0615 | LH ₂ Cylinder n=3, ET n=1 |
| 17 | 472.9 | 0.0114 | LH ₂ Cylinder n=3 |
| 18 | 482.2 | 0.0185 | ET n=2 |
| 19 | 498.6 | 0.0076 | LOX n=3 |
| 20 | 513.2 | 0.0697 | ET n=1, 2, 3 |
| 21 | 533.1 | 0.0243 | ET n=2, 1 |
| 22 | 567.2 | 0.0487 | ET n=1, 2, 3 |
| 23 | 604.6 | 0.0391 | ET n=2, 1, 3 |
| 24 | 625.4 | 0.0116 | LOX n=3 |
| 25 | 628.0 | 0.0144 | ET n=3,2 |

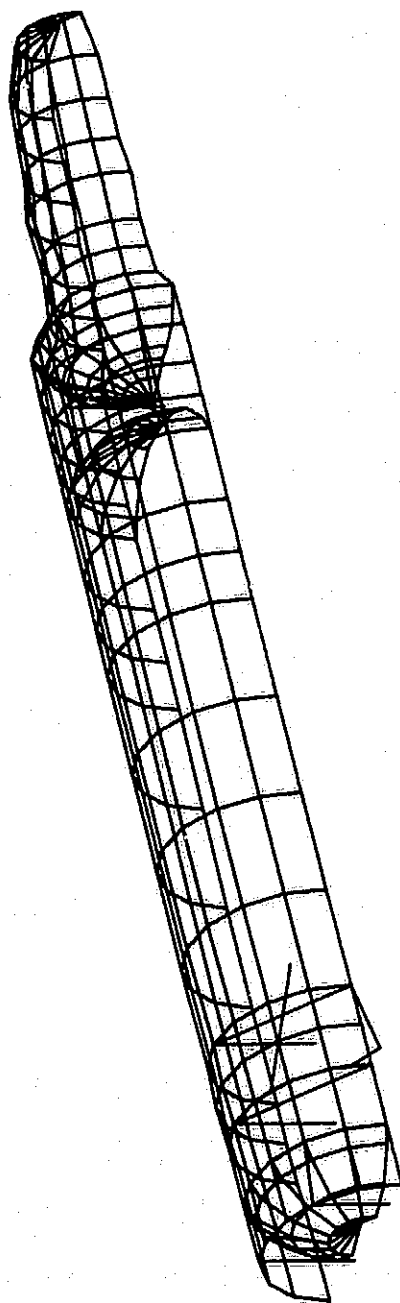


Fig. 3-5 Lufthoff Mode 4 (Modes 1, 2, 3 are Rigid Body Modes)

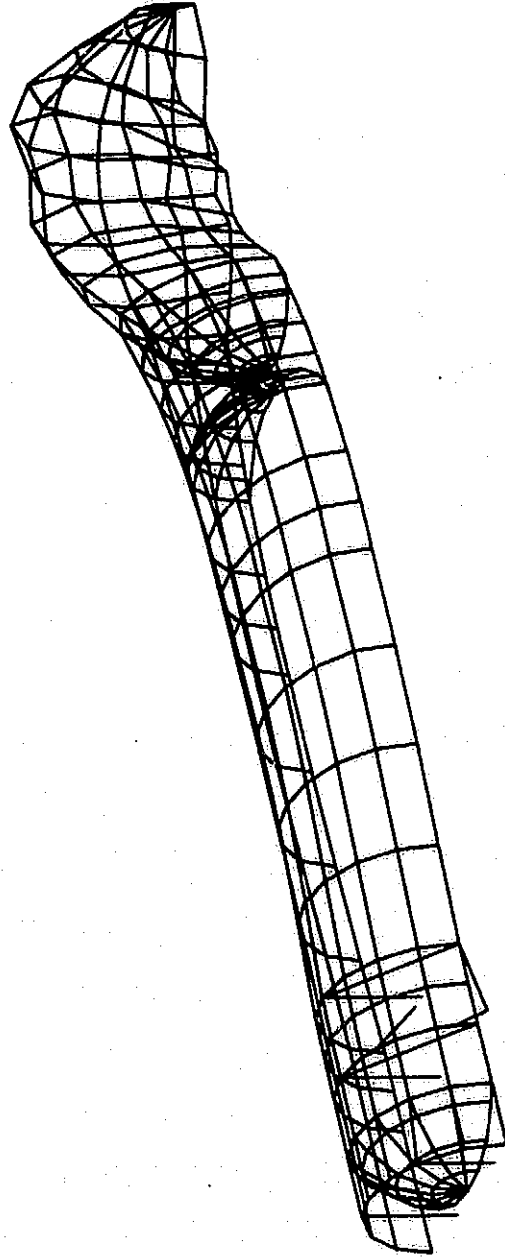


Fig. 3-6 Liftoff Mode 5

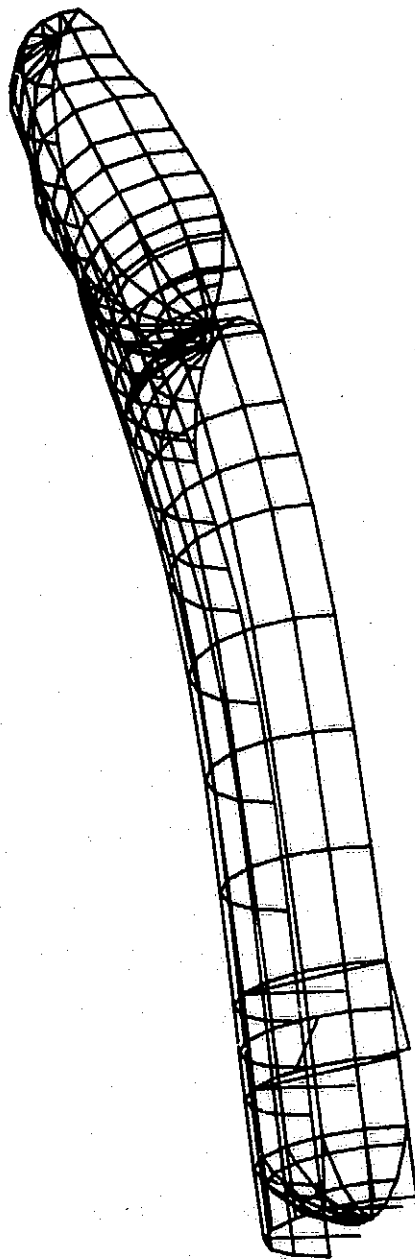


Fig. 3-7 Liftoff Mode 6

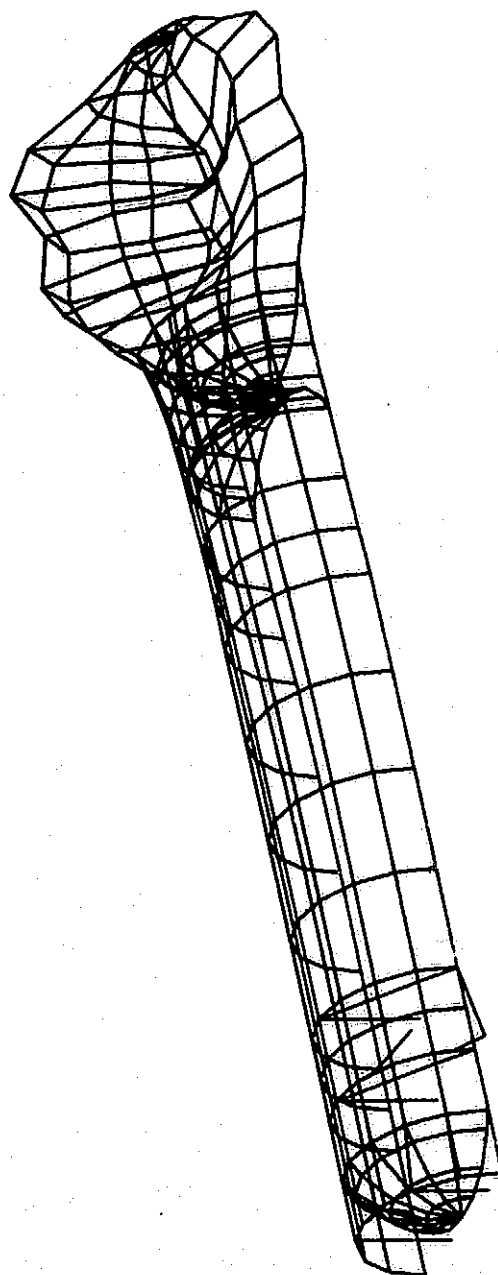


Fig. 3-8 Liftoff Mode 7

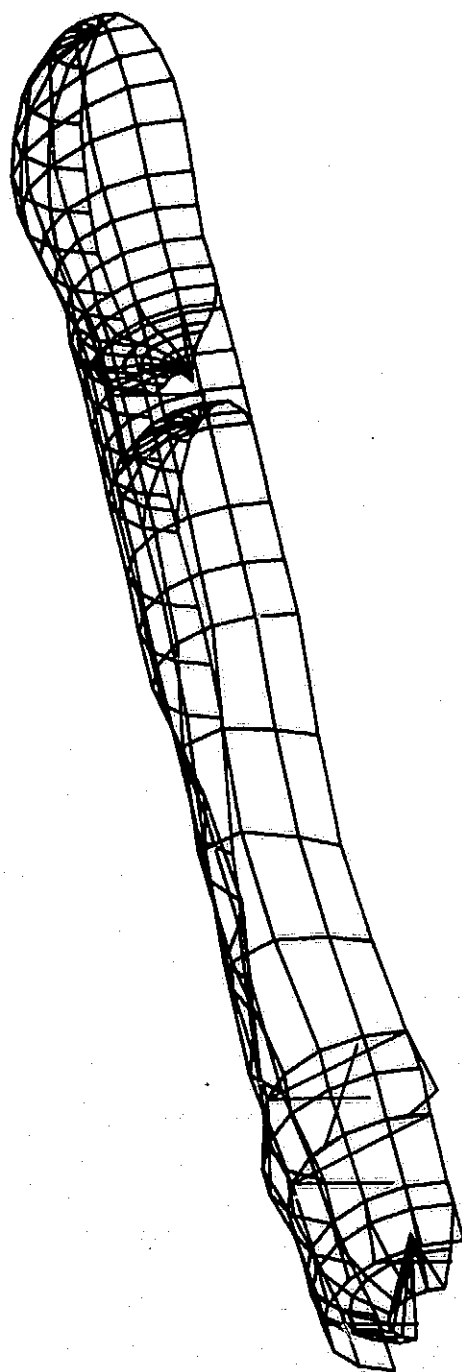


Fig. 3-9 Lifting Mode 8

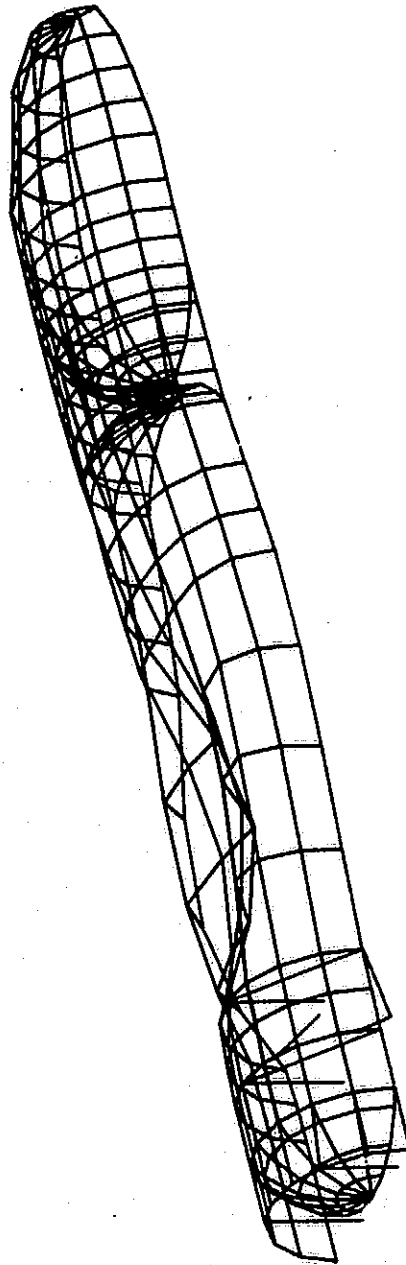


Fig. 3-10 Lift-off Mode 9

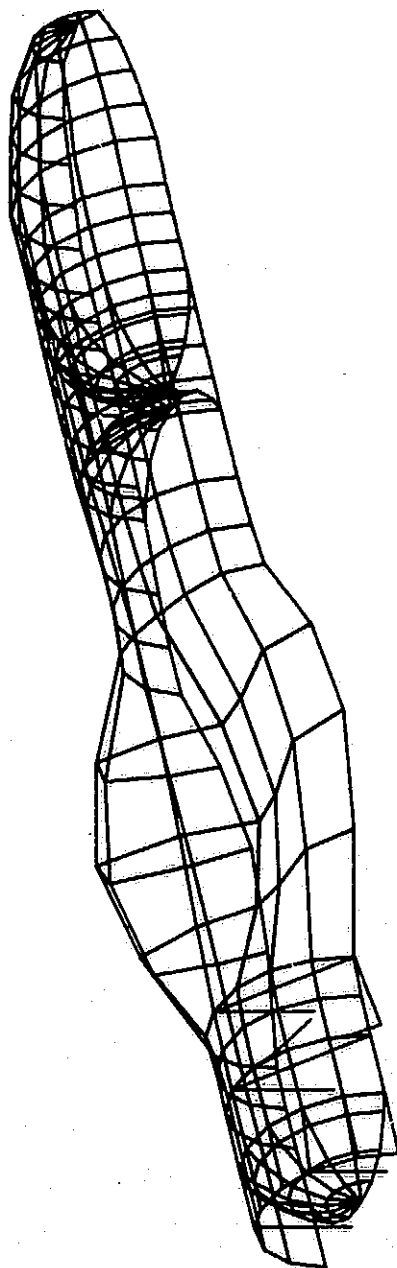


Fig. 3-11 Liffoff Mode 10

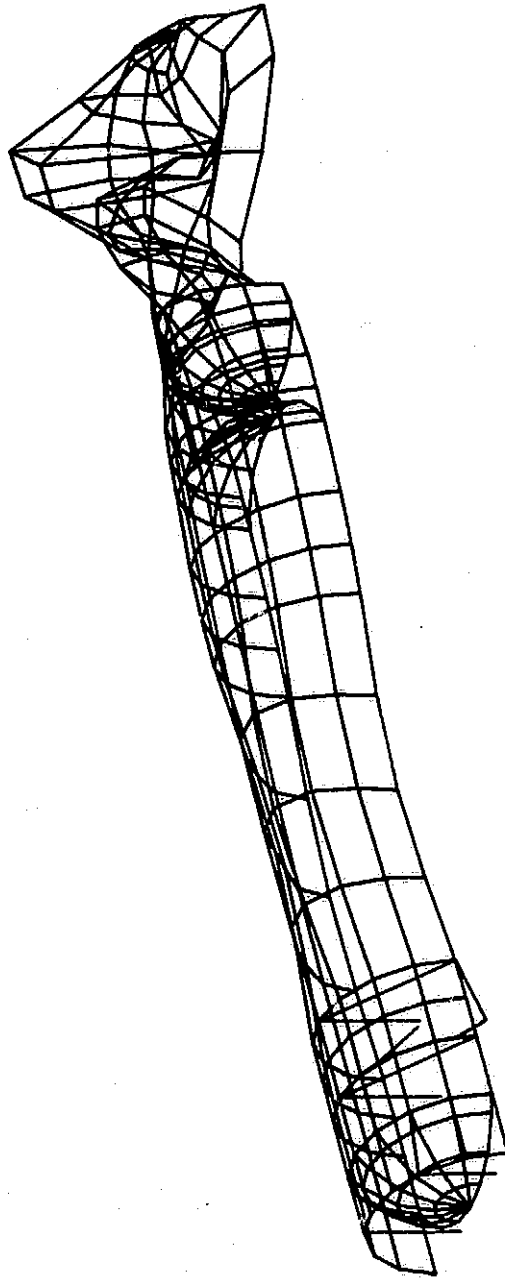


Fig. 3-12 Liftoff Mode 11

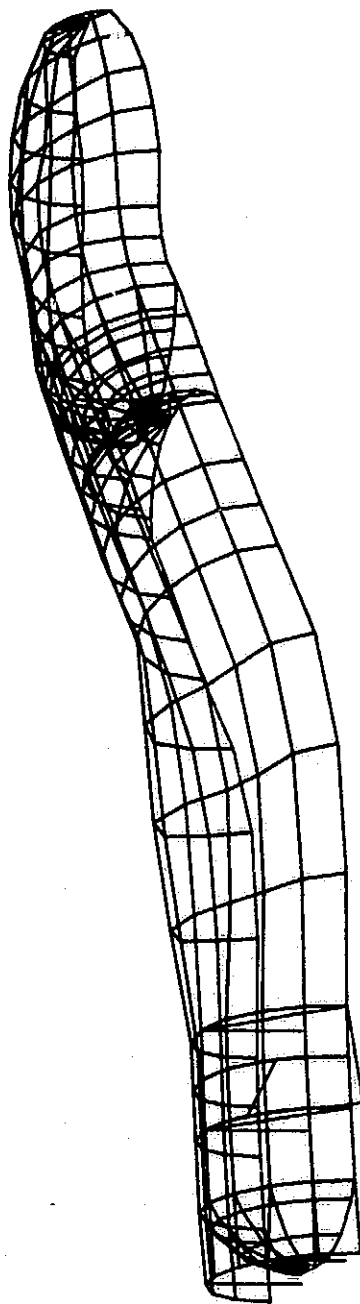


Fig. 3-13 Liftoff Mode 12

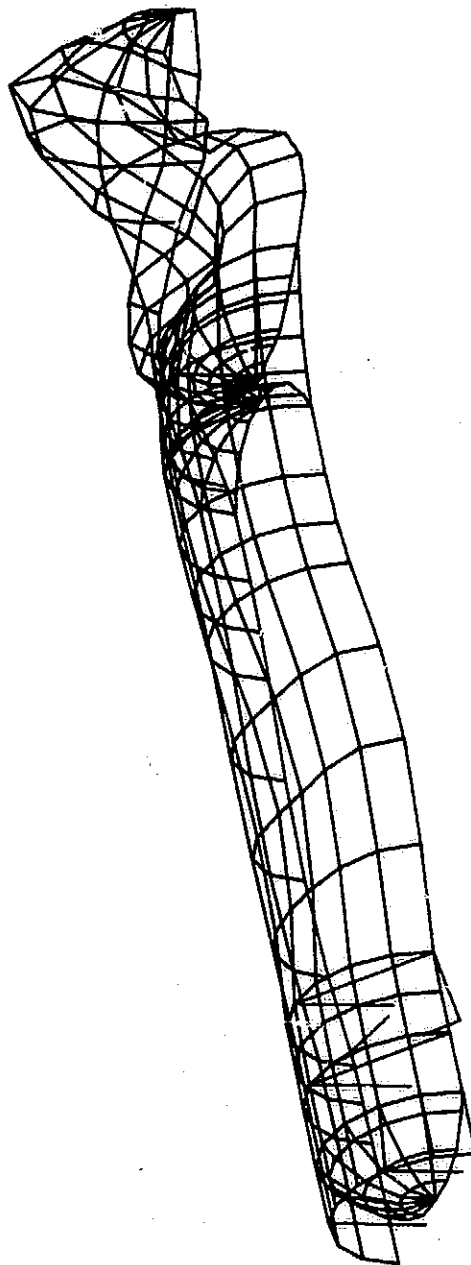


Fig. 3-14 Liftoff Mode 13

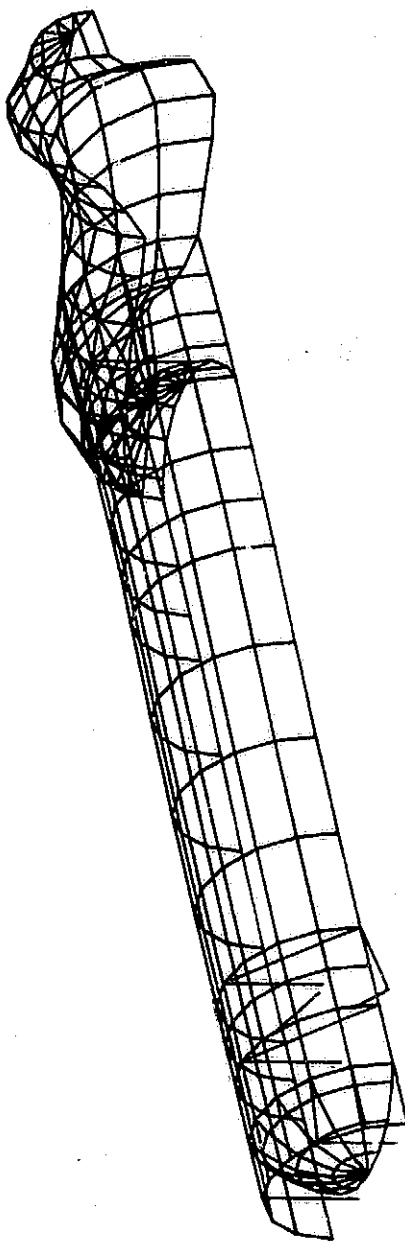


Fig. 3-15 Liftoff Mode 14

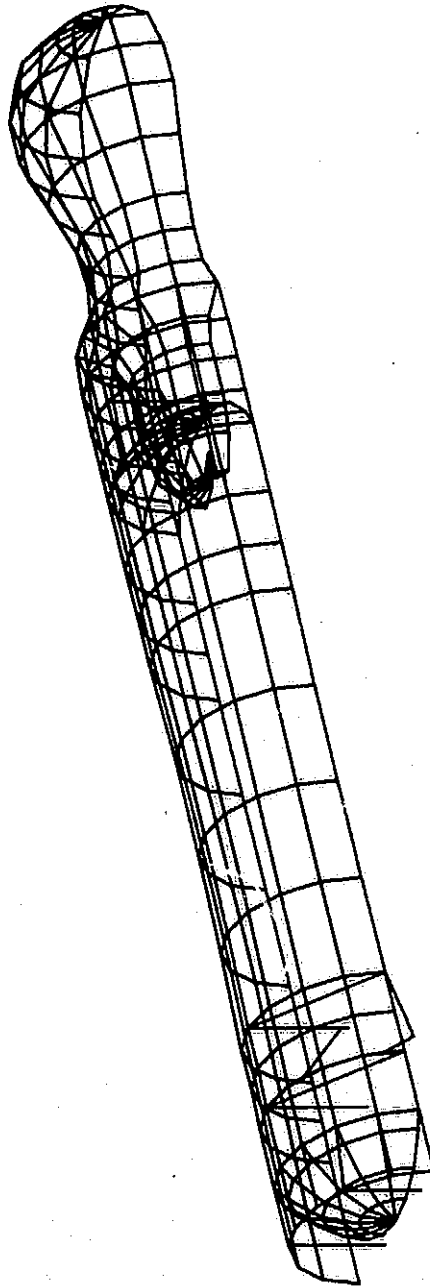


Fig. 3-16 Liftoff Mode 15

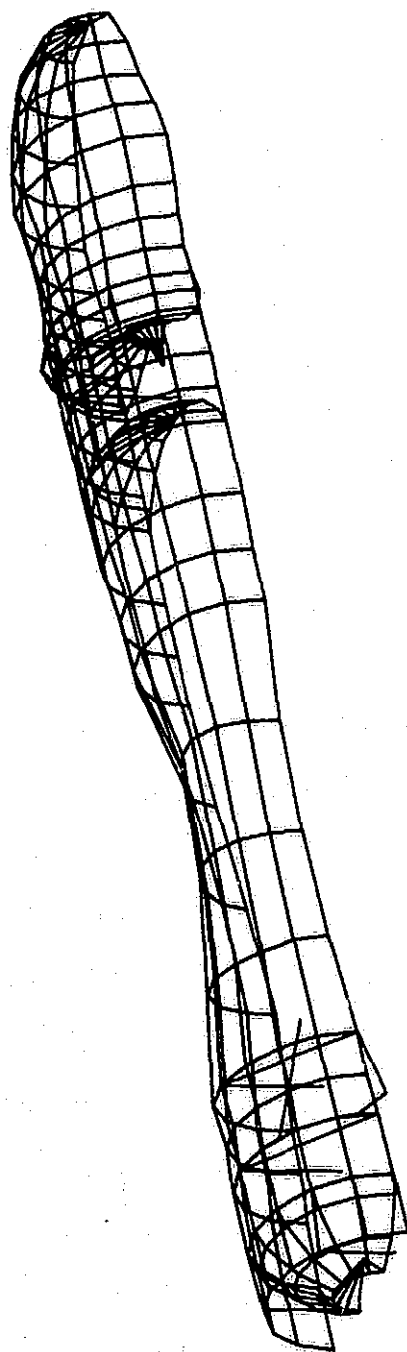


Fig. 3-17 Liftoff Mode 16

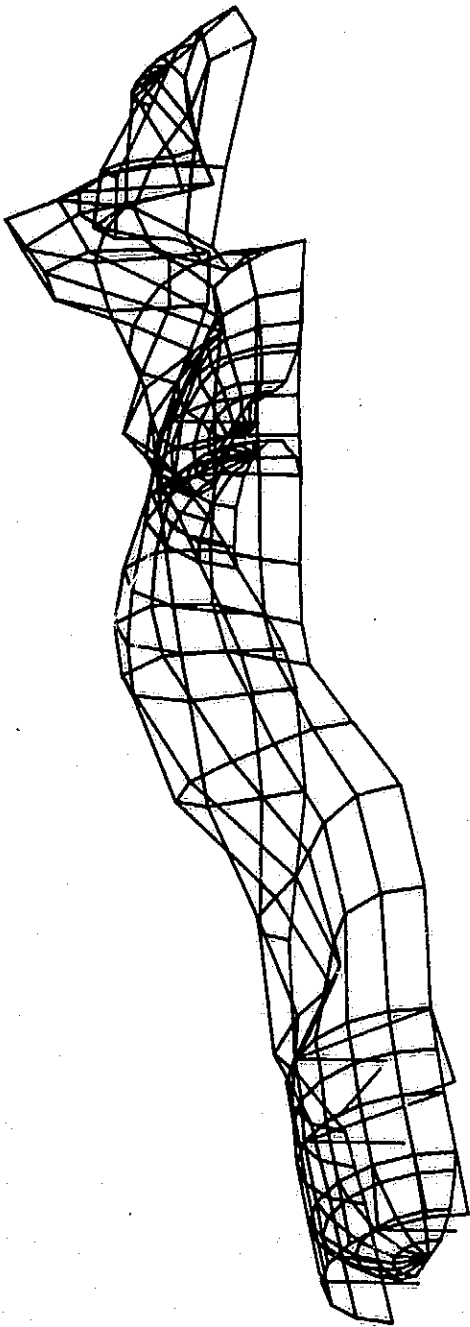


Fig. 3-18 Liftoff Mode 17

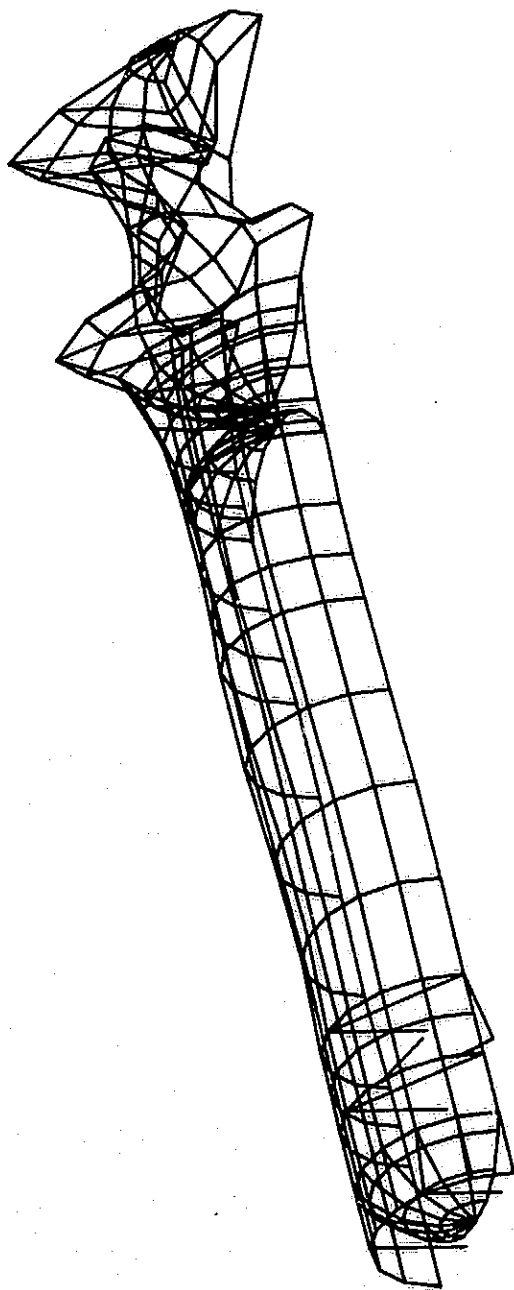


Fig. 3-19 Liftoff Mode 18

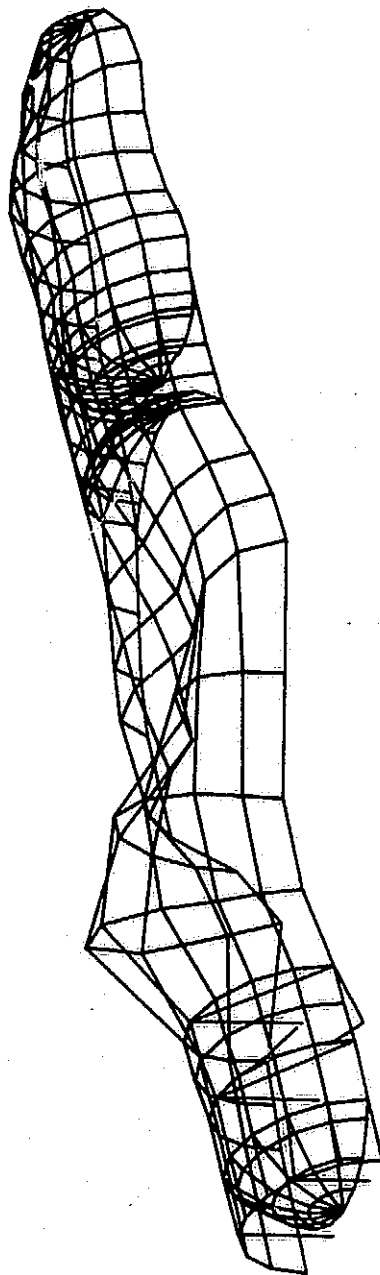


Fig. 3-20 Liftoff Mode 19

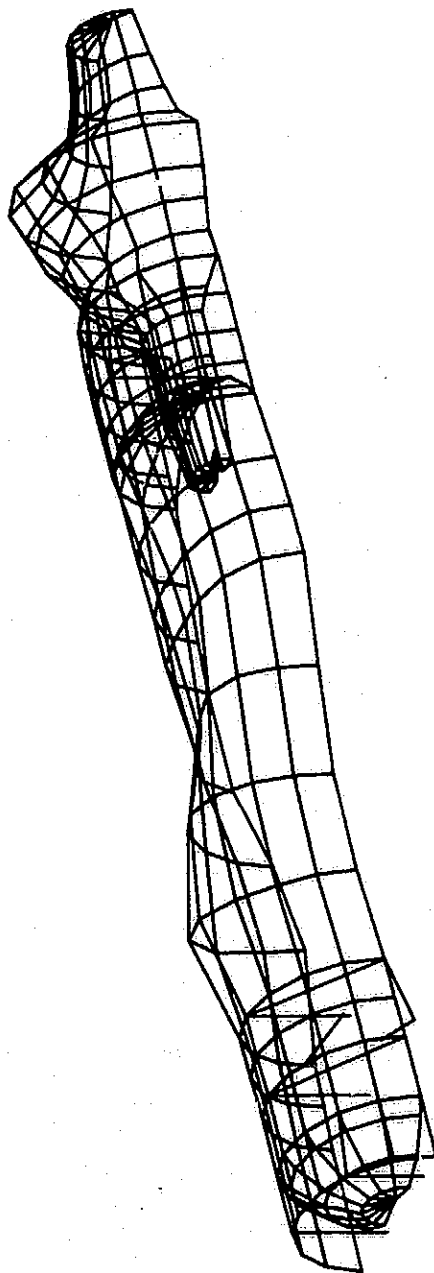


Fig. 3-21 Liftoff Mode 20

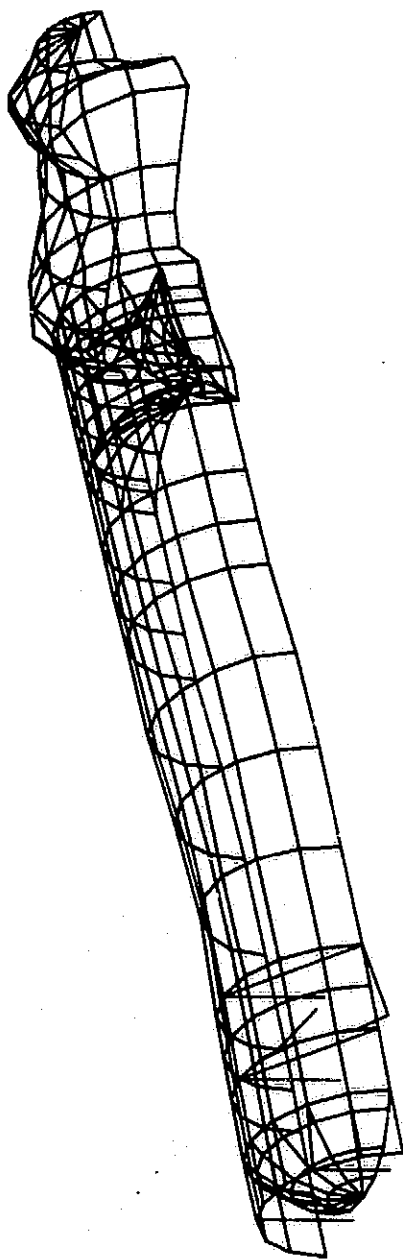


Fig. 3-22 Liftoff Mode 21

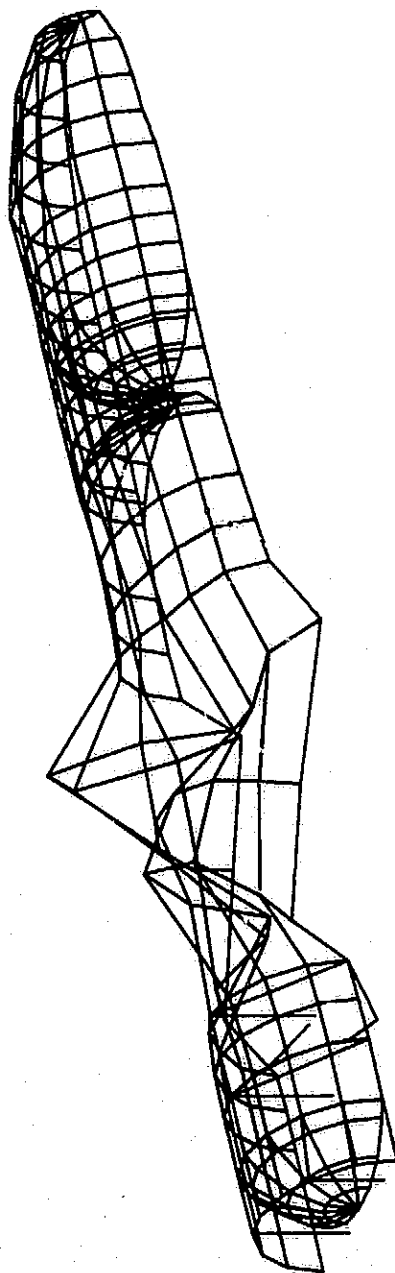


Fig. 3-23 Liftoff Mode 22

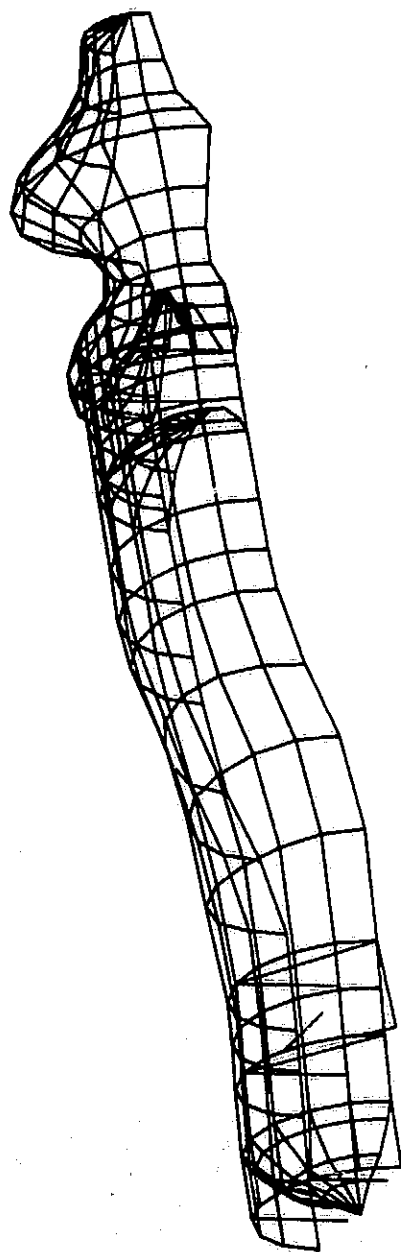


Fig. 3-24 Liftoff Mode 23

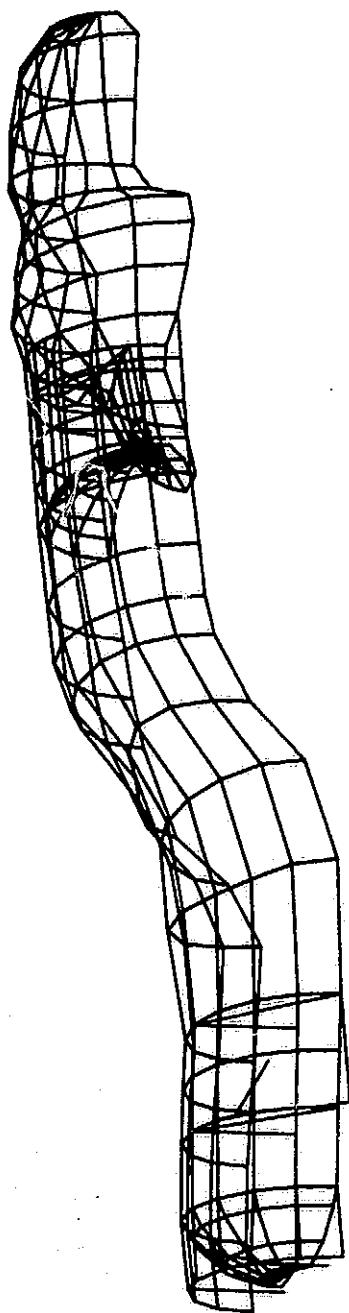


Fig. 3-25 Liftoff Mode 24

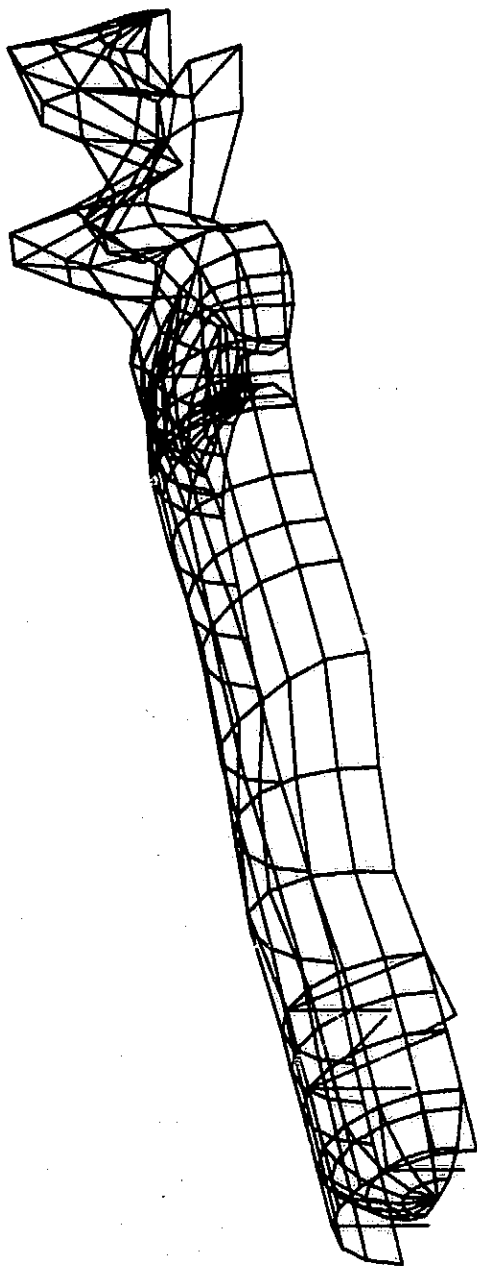


Fig. 3-26 Liftoff Mode 25

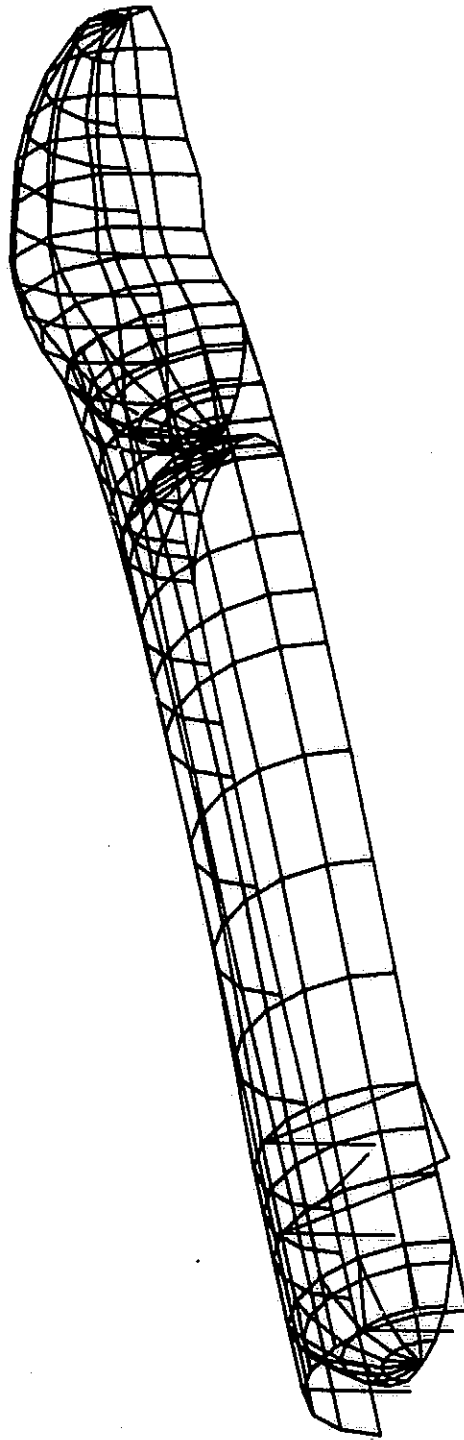


Fig. 3-27 Post Max Q Mode 4 (without Apex Fix)

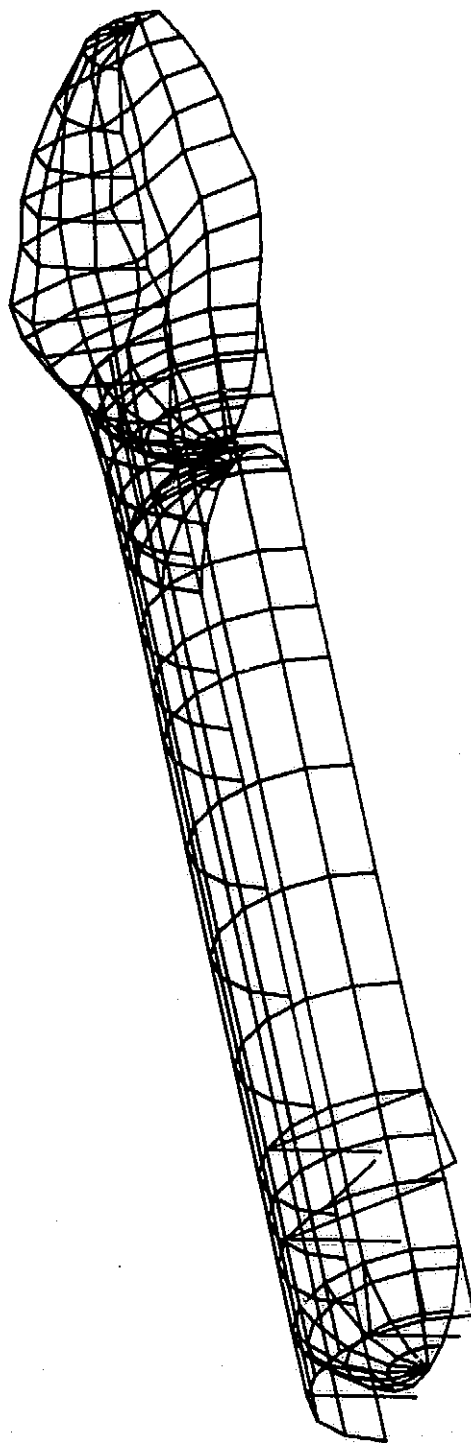


Fig. 3-28 Post Max Q Mode 5 (without Apex Fix)

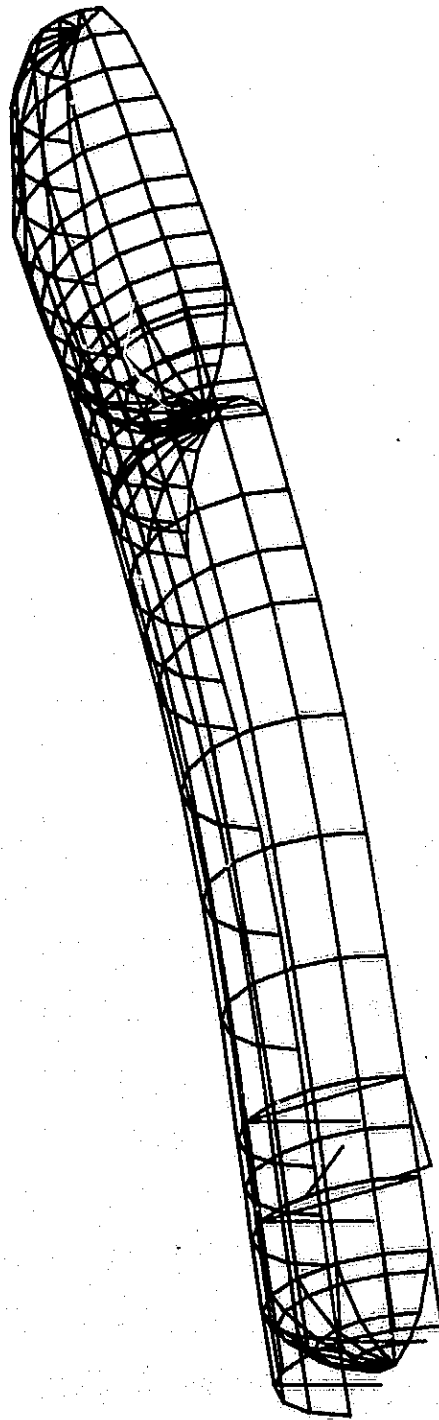


Fig. 3-29 Post Max Q Mode 6 (without Apex Fix)

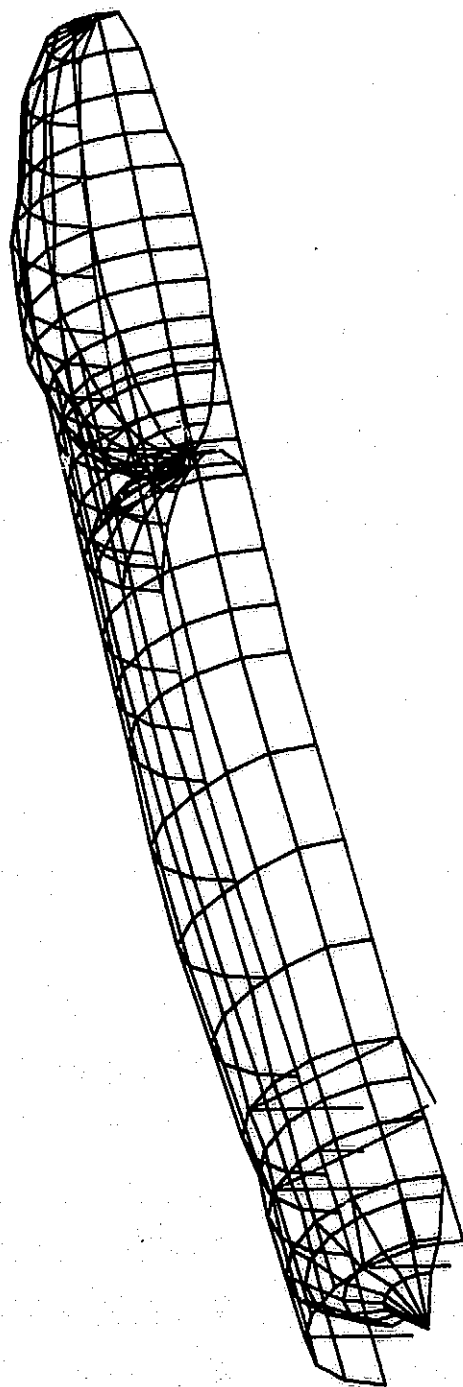


Fig. 3-30 Post Max Q Mode 7 (without Apex Fix)

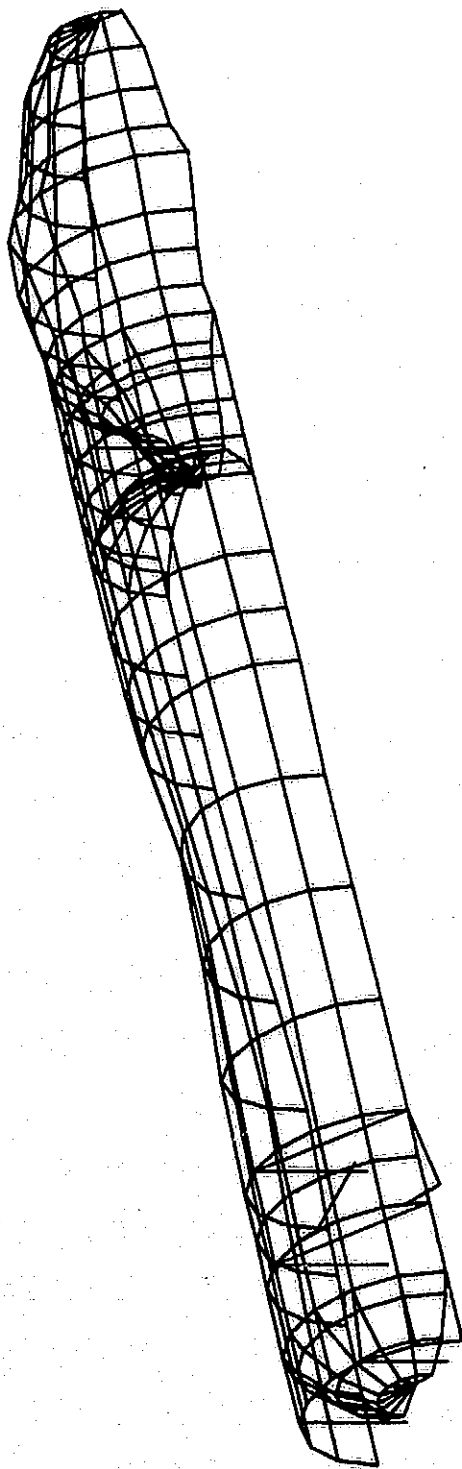


Fig. 3-31 Post Max Q Mode 15 (without Apex Fix)

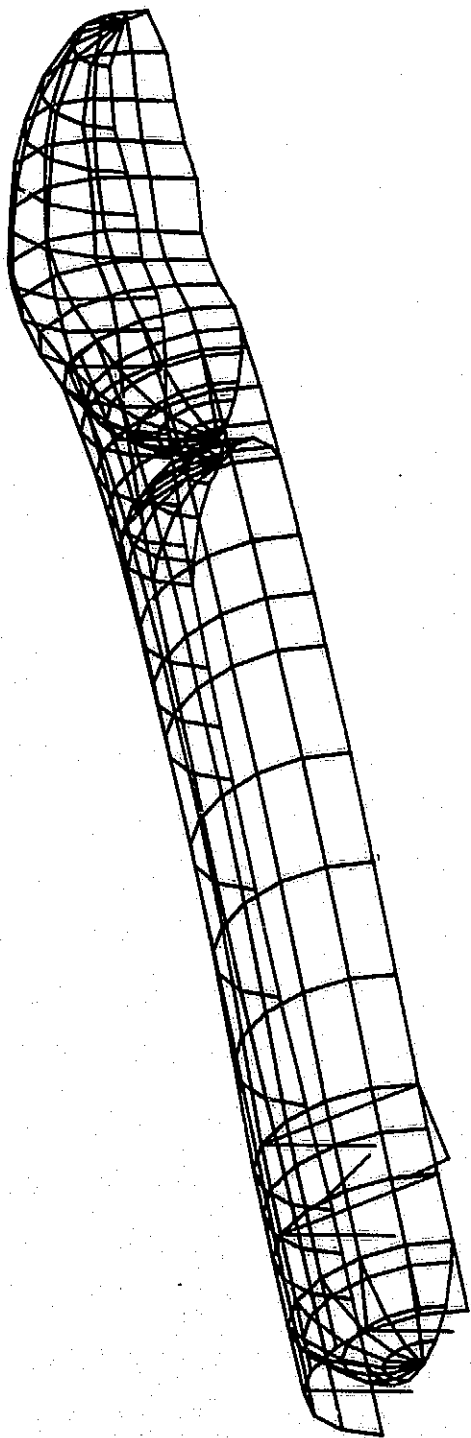


Fig. 3-32 Post Max Q Mode 4

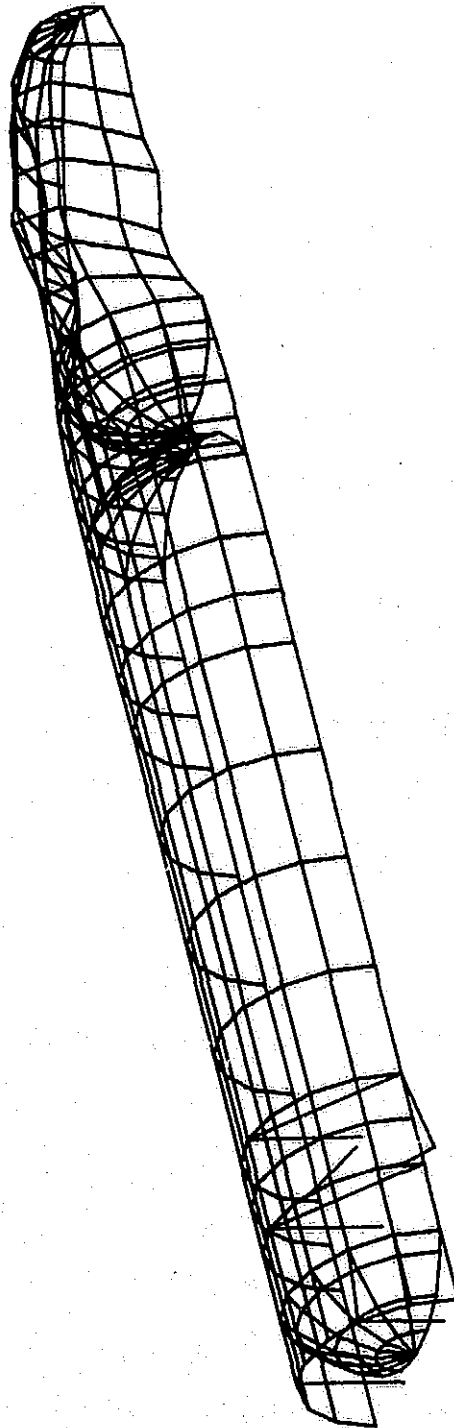


Fig. 3-33 Post Max Q Mode 5

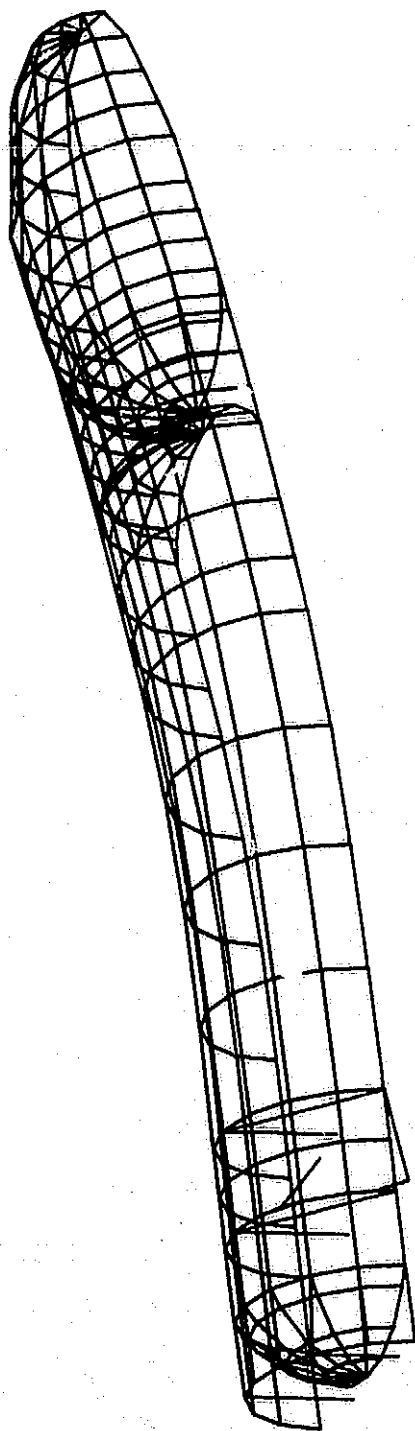


Fig. 3-34 Post Max Q Mode 6

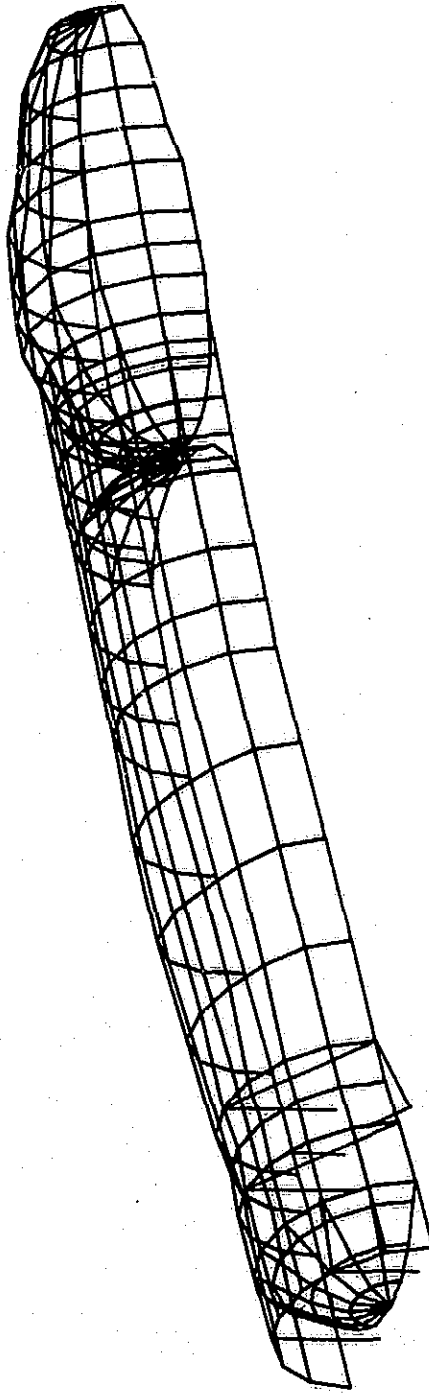


Fig. 3-35 Post Max Q, Mode 7

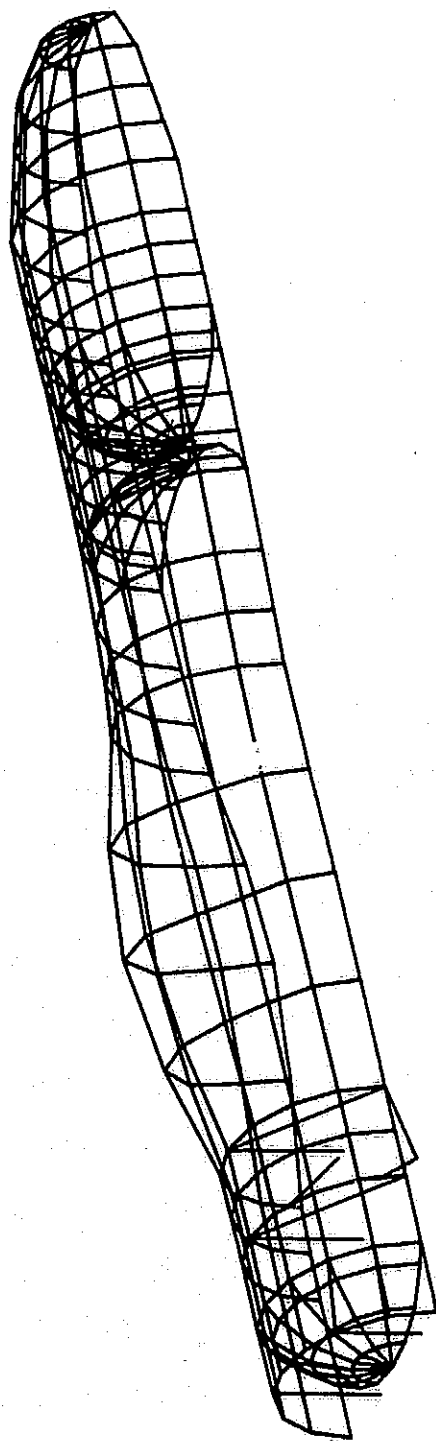


Fig. 3-36 Post Max Q Mode 8

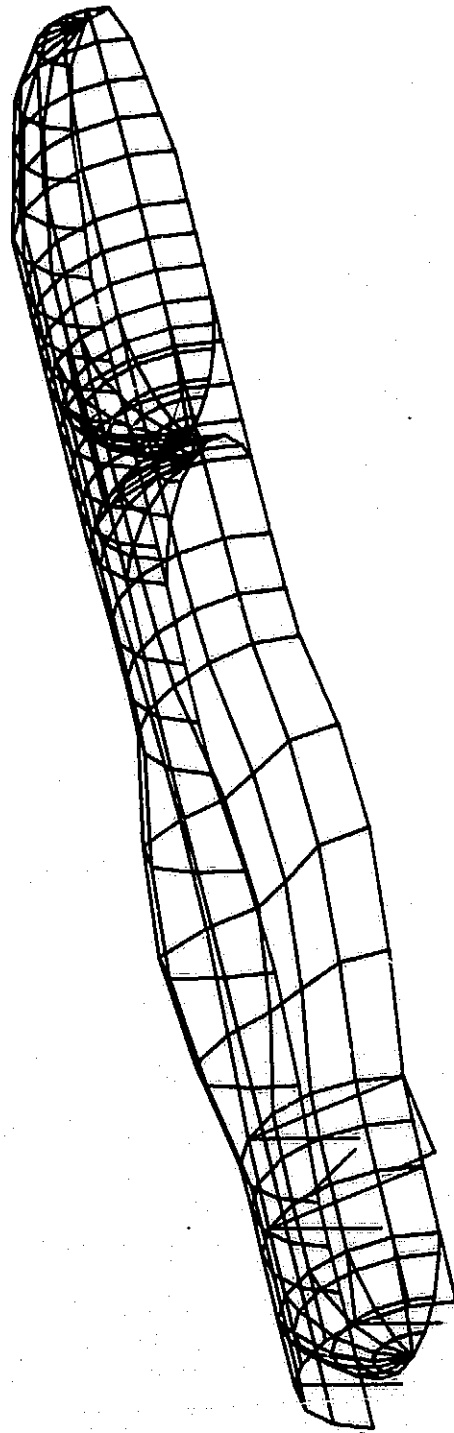


Fig. 3-37 Post Max Q Mode 9

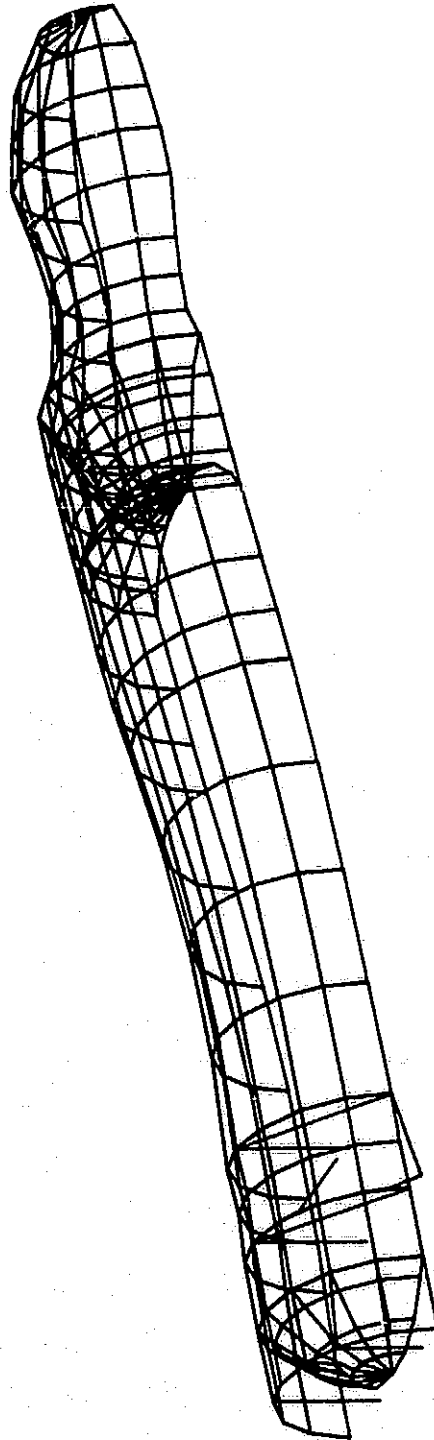


Fig. 3-38 Post Max Q Mode 10

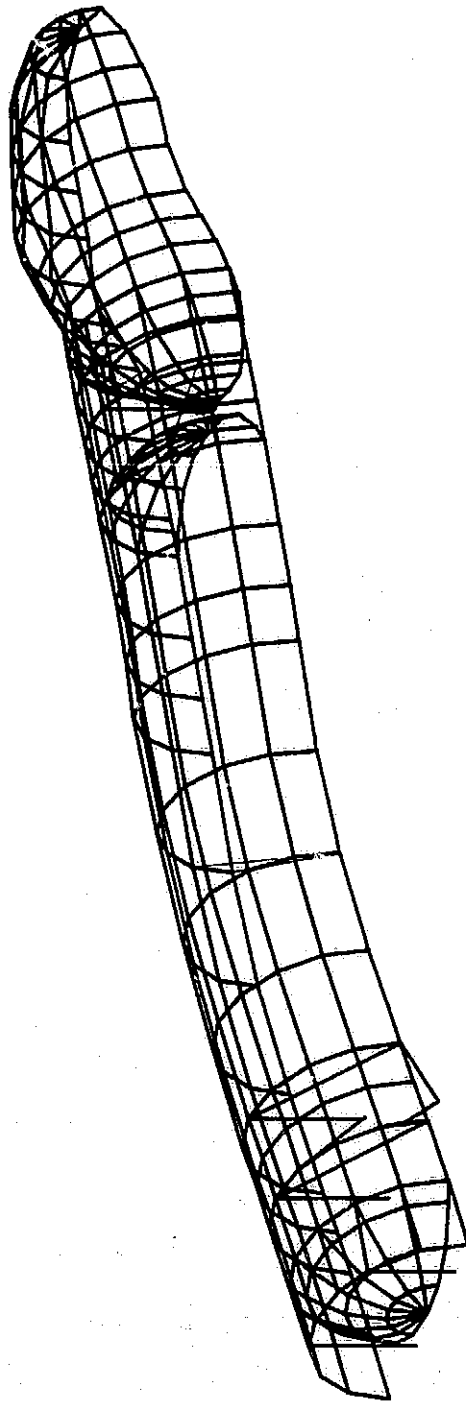


Fig. 3-39 Post Max Q Mode 11

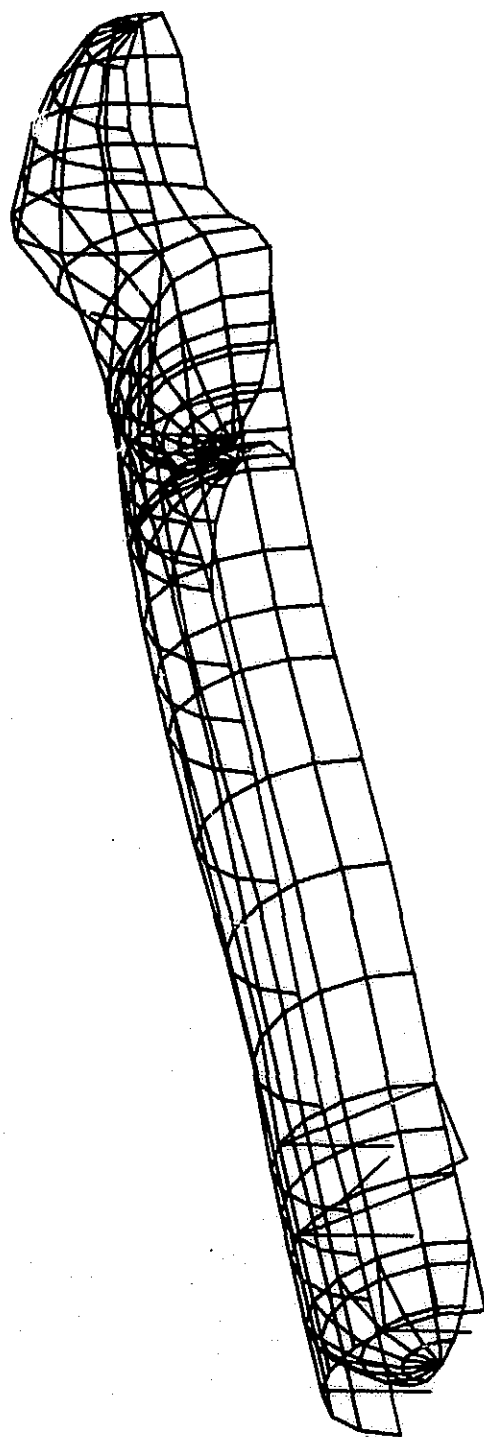


Fig. 3-40 Post Max Q Mode 12

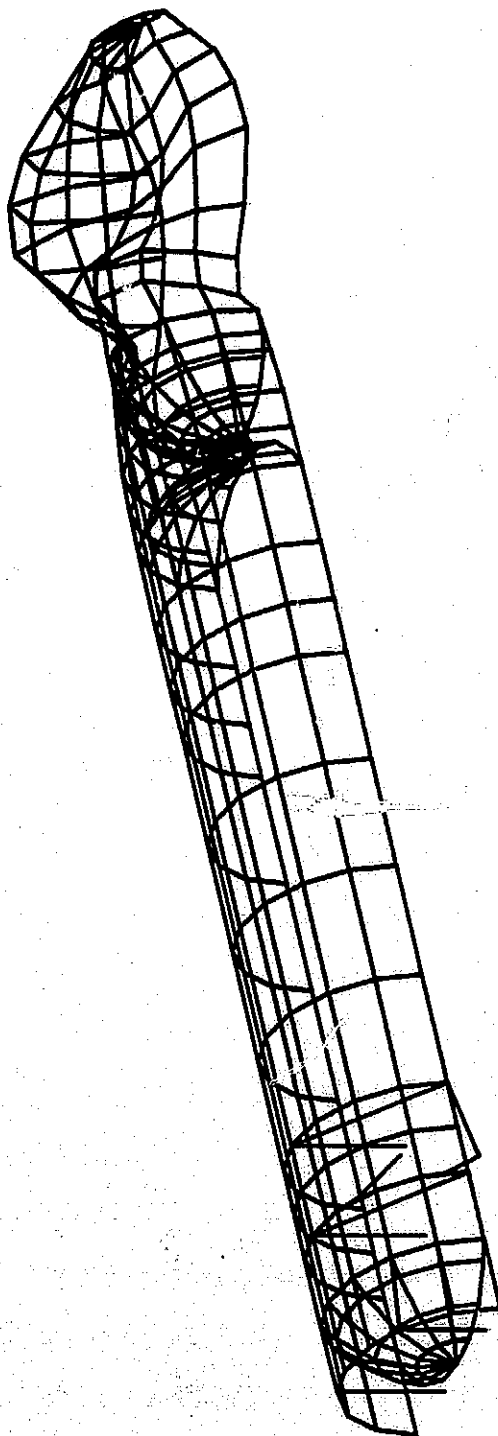


Fig. 3-41 Post Max Q Mode 13

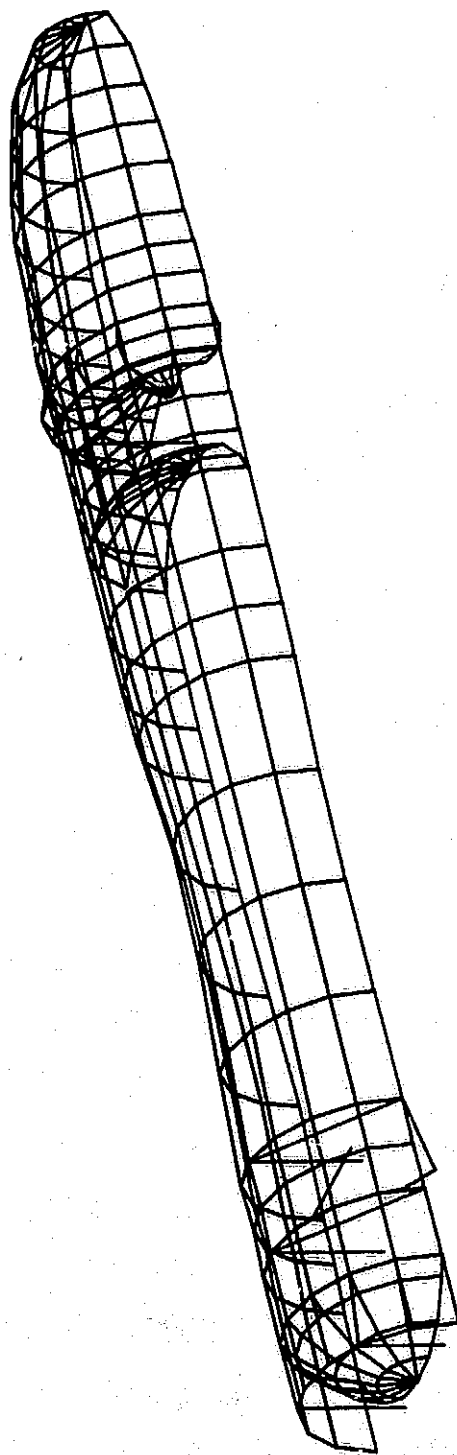


Fig. 3-42 Post Max Q Mode 14

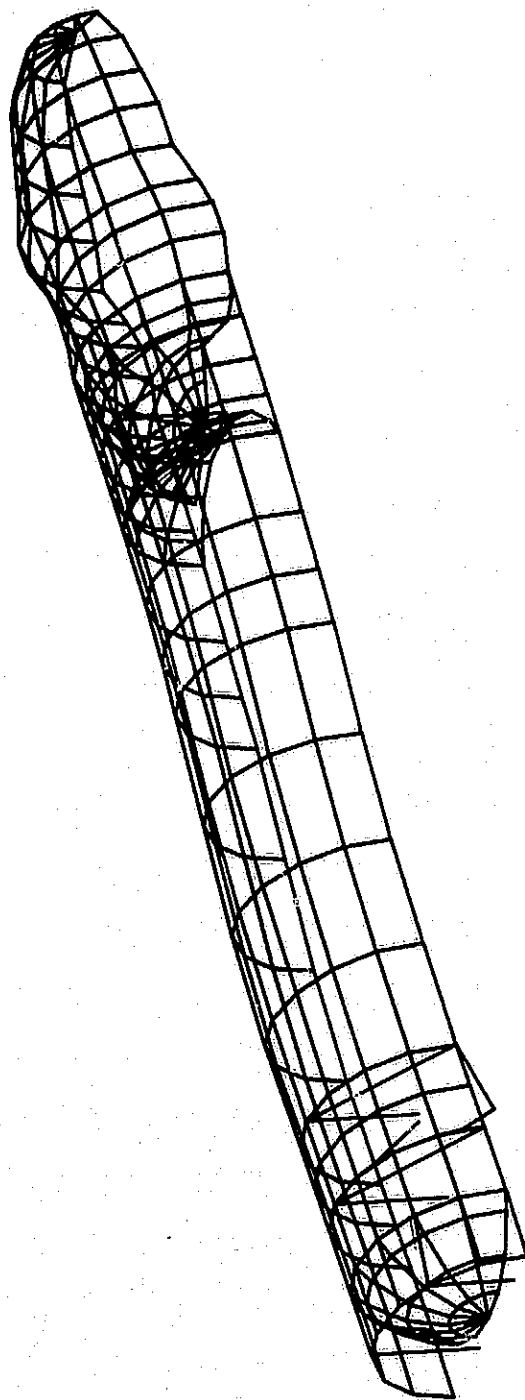


Fig. 3-43 Post Max Q Mode 15

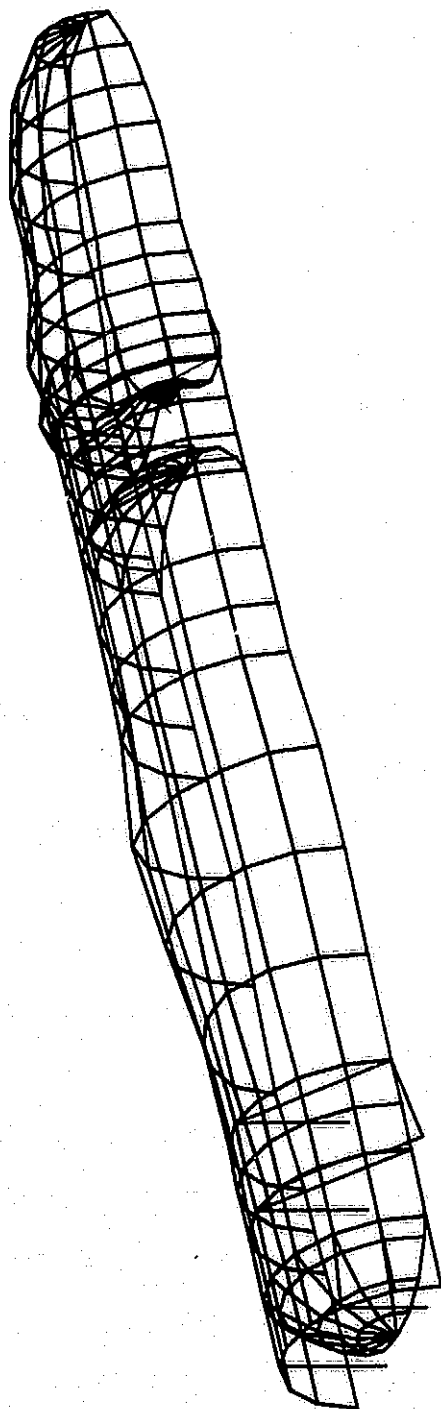


Fig. 3-44 Post Max Q Mode 16

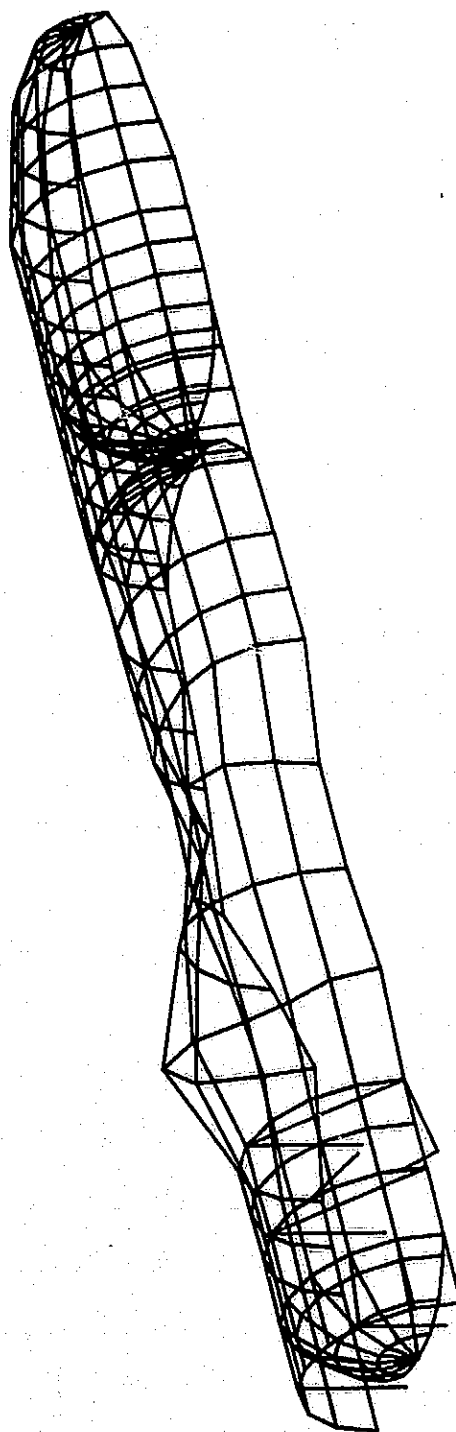


Fig. 3-45 Post Max Q Mode 17

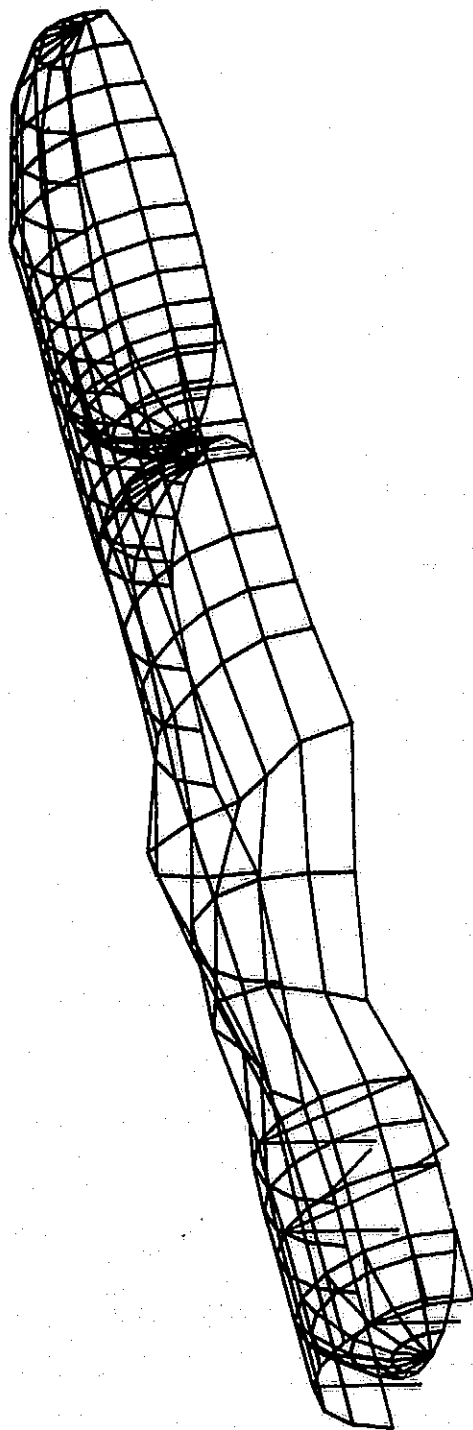


Fig. 3-46 Post Max Q. Mode 18

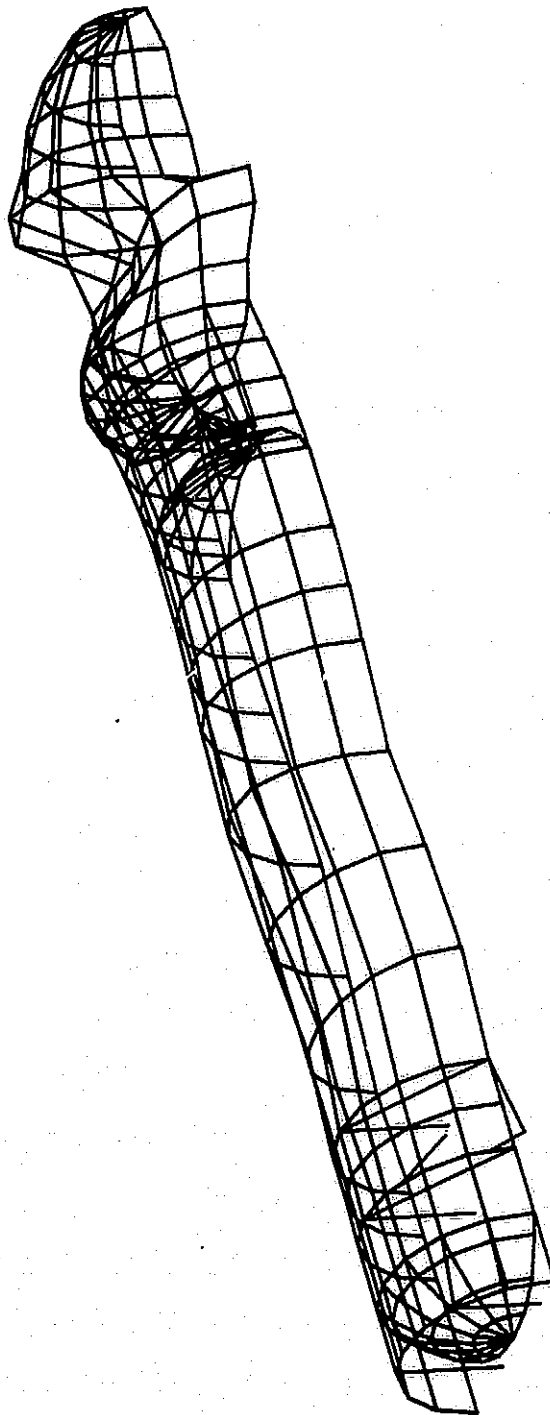


Fig. 3-47 Post Max Q Mode 19

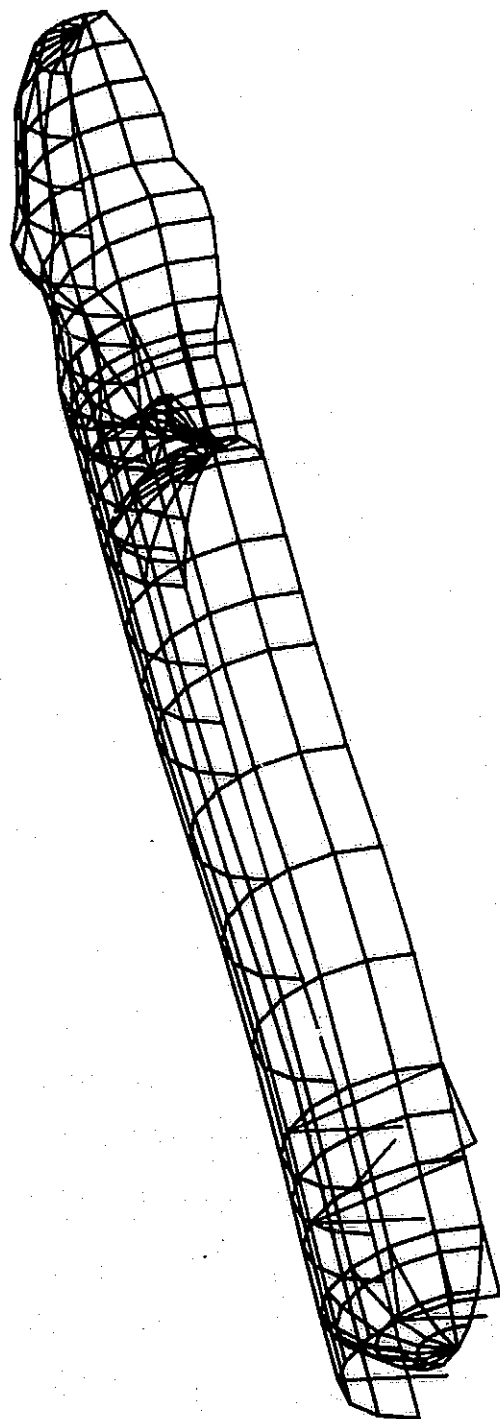


Fig. 3-48 Post Max Q Mode 20

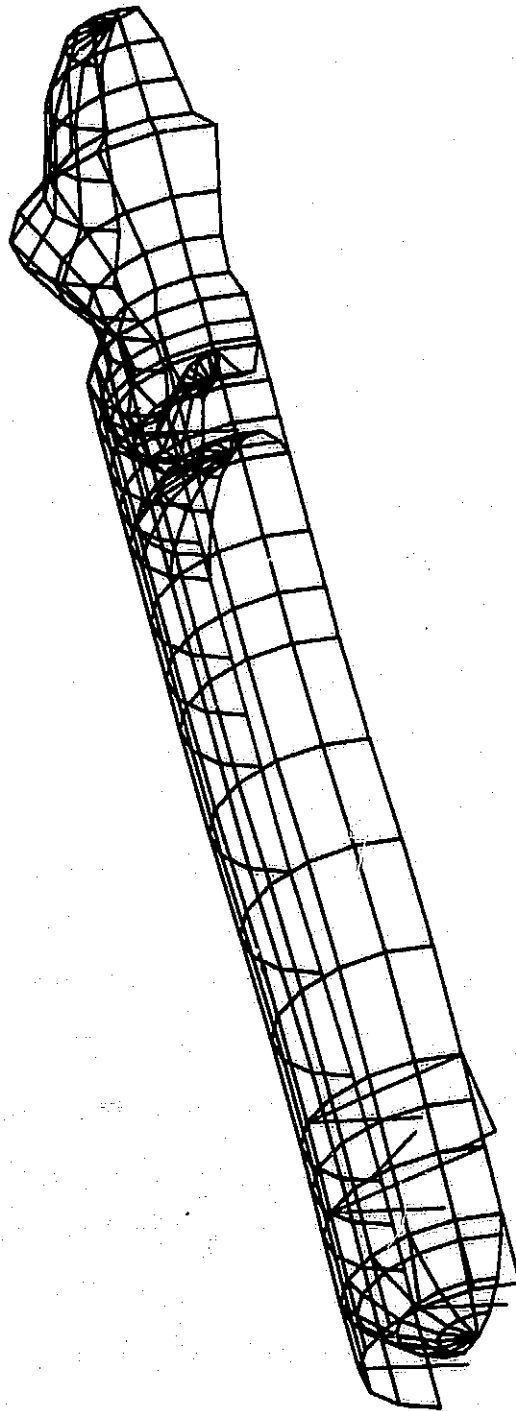


Fig. 3-49 Post Max Q Mode 21

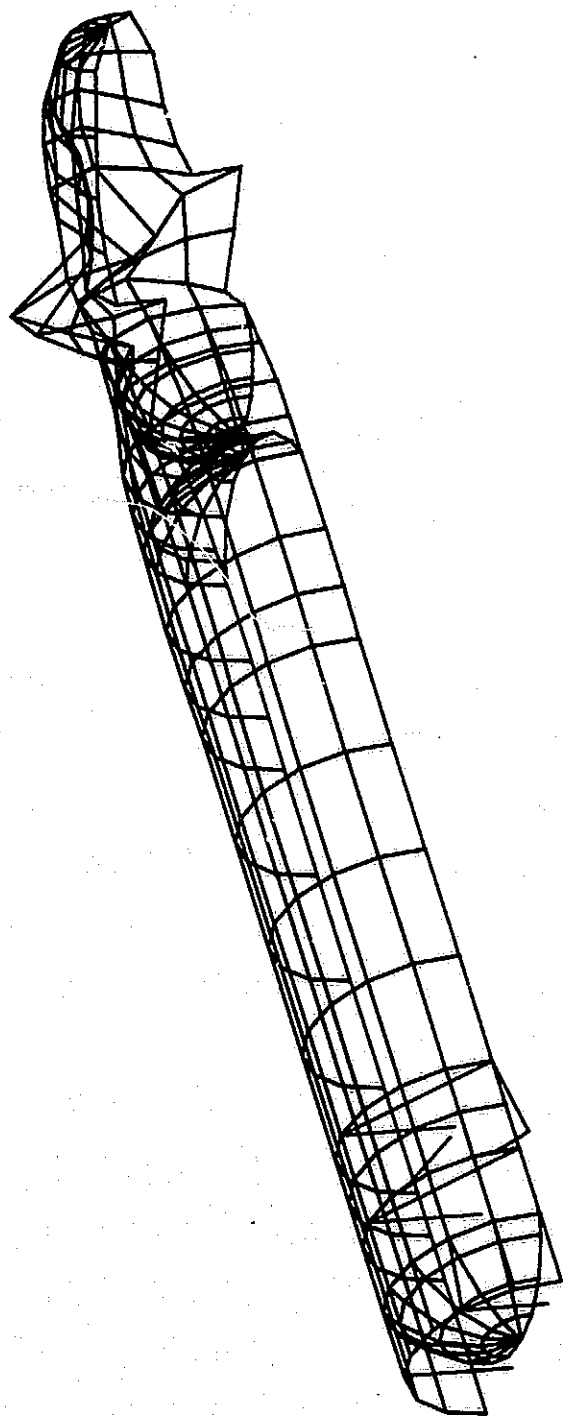


Fig. 3-50 Post Max Q Mode 22

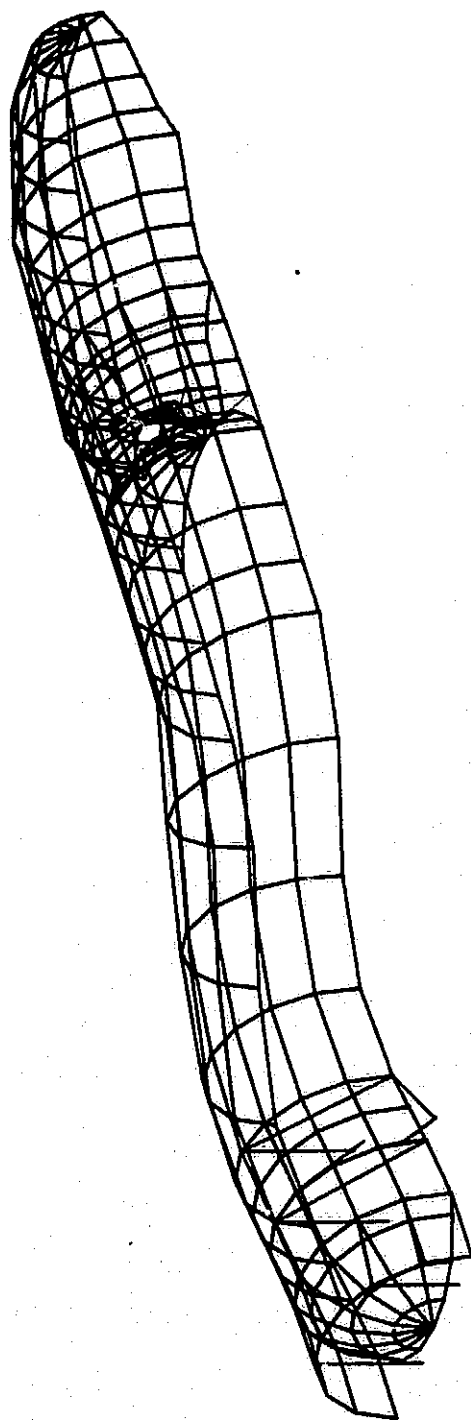


Fig. 3-51 Post Max Q. Mode 23

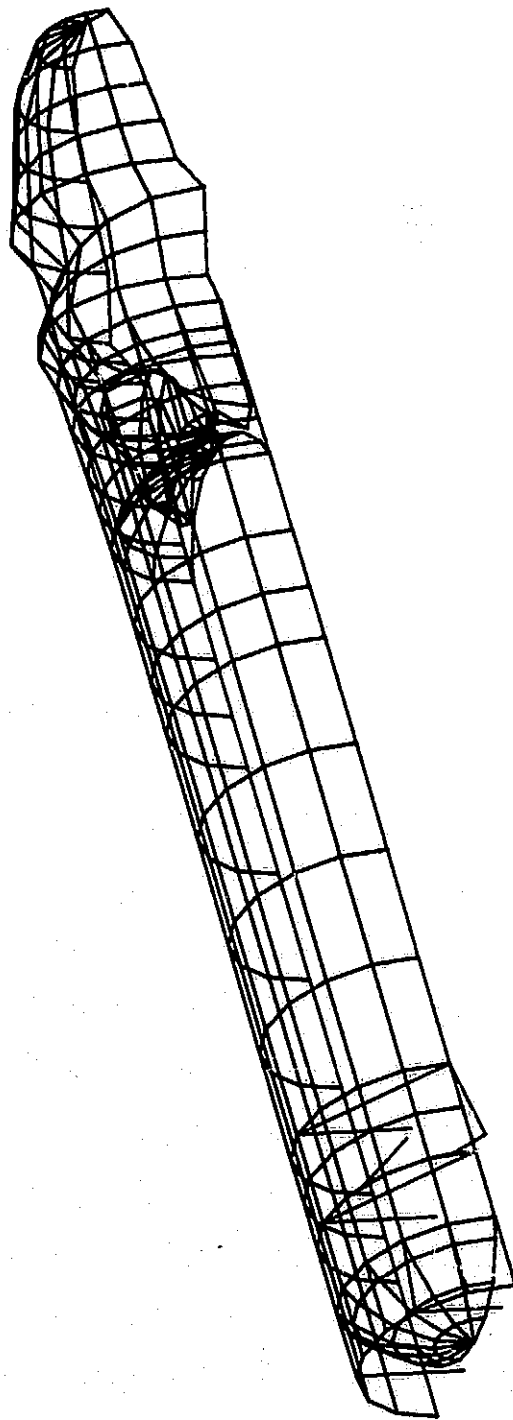


Fig. 3-52 Post Max Q Mode 24

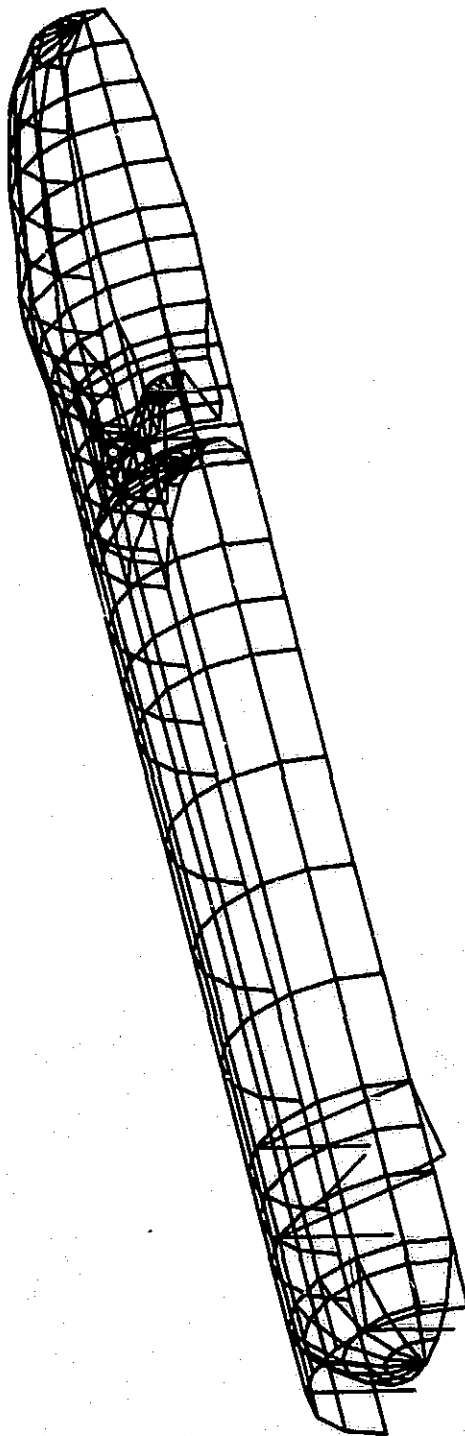


Fig. 3-53 Post Max Q Mode 25

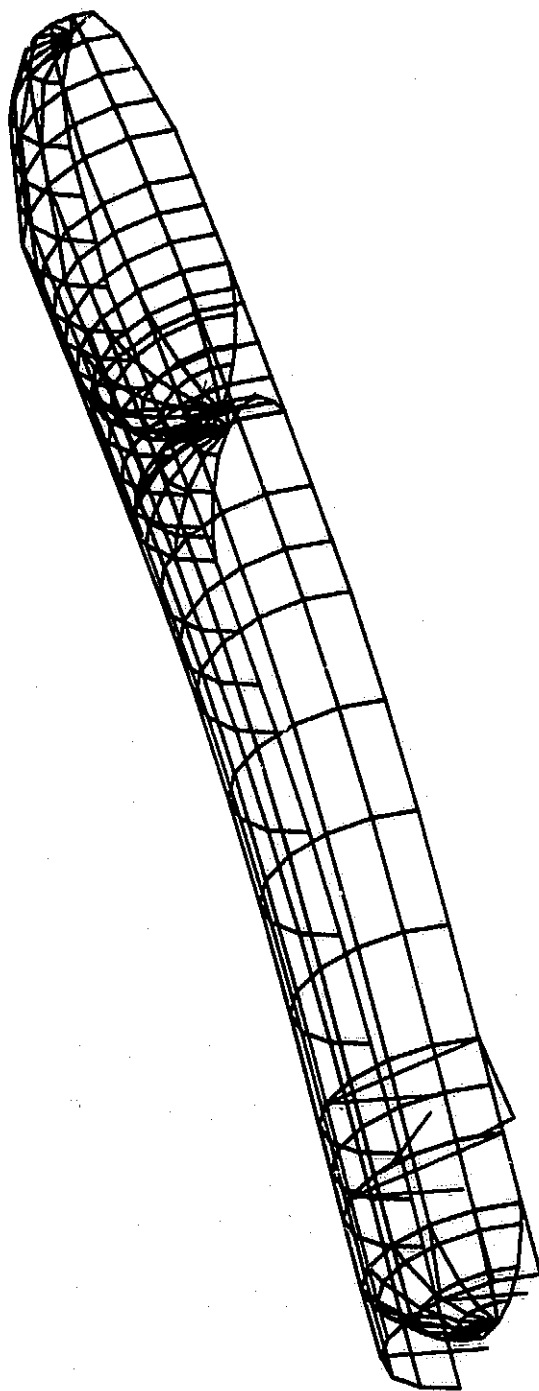


Fig. 3-54 Empty External Tank, Mode 4

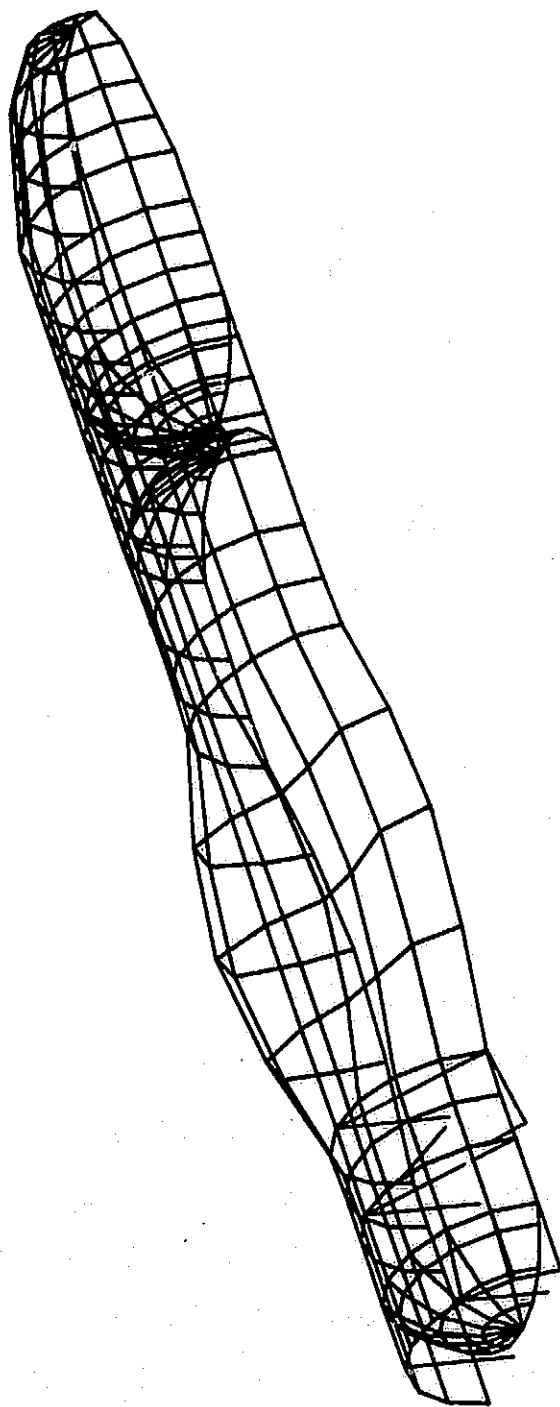


Fig. 3-55 Empty External Tank, Mode 5

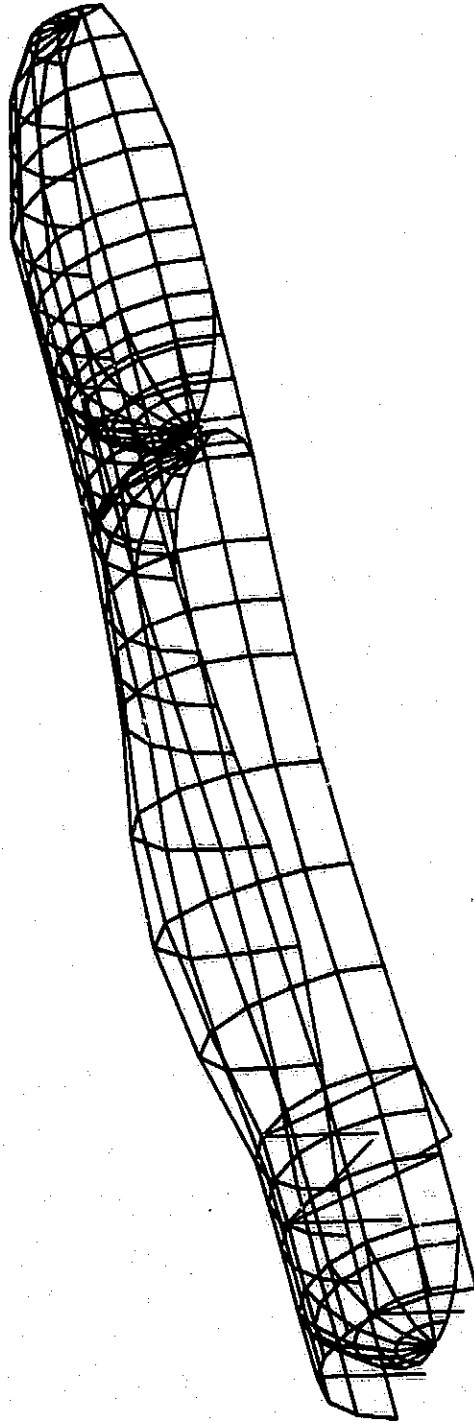


Fig. 3-56 Empty External Tank, Mode 6

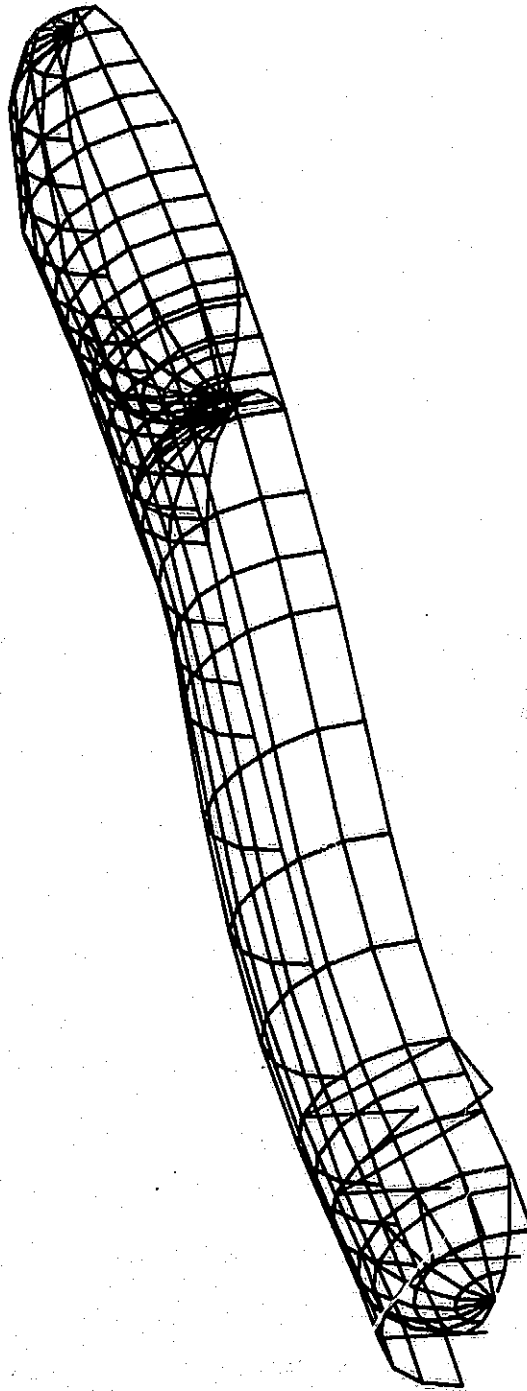


Fig. 3-57 Empty External Tank, Mode 7

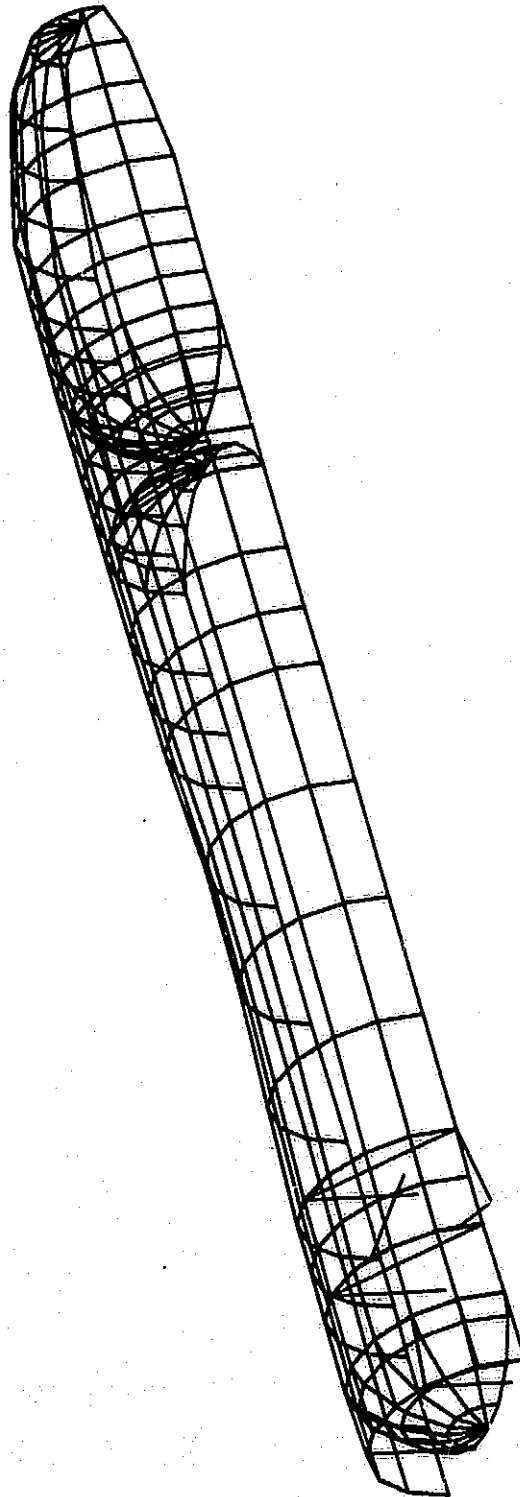


Fig. 3-58 Empty External Tank, Mode 8

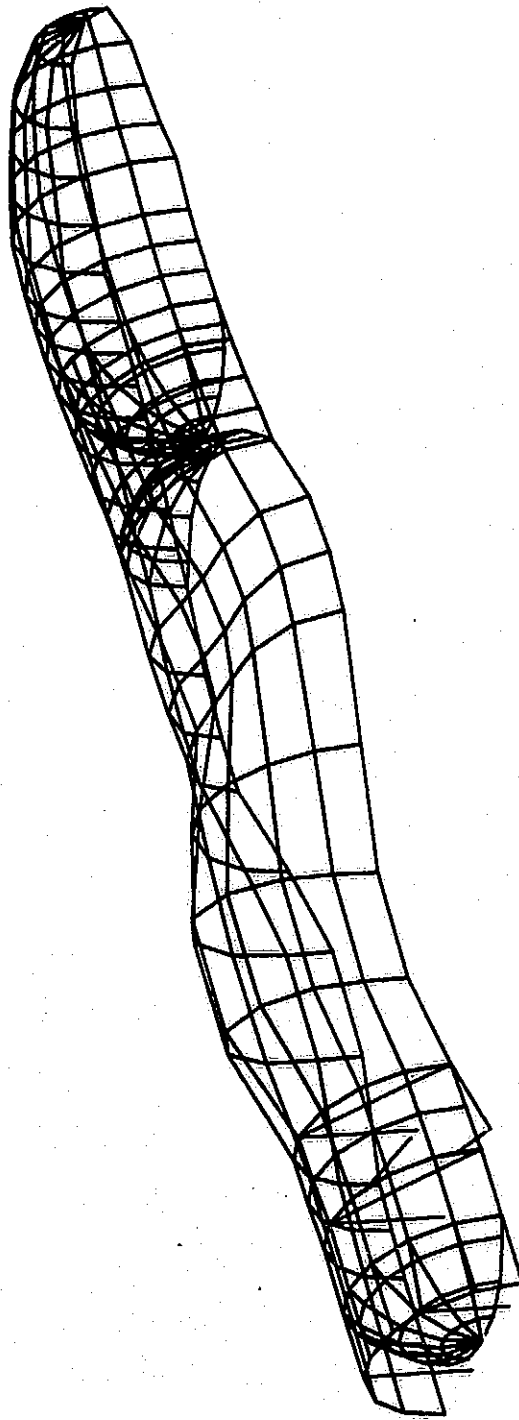


Fig. 3-59 Empty External Tank, Mode 9

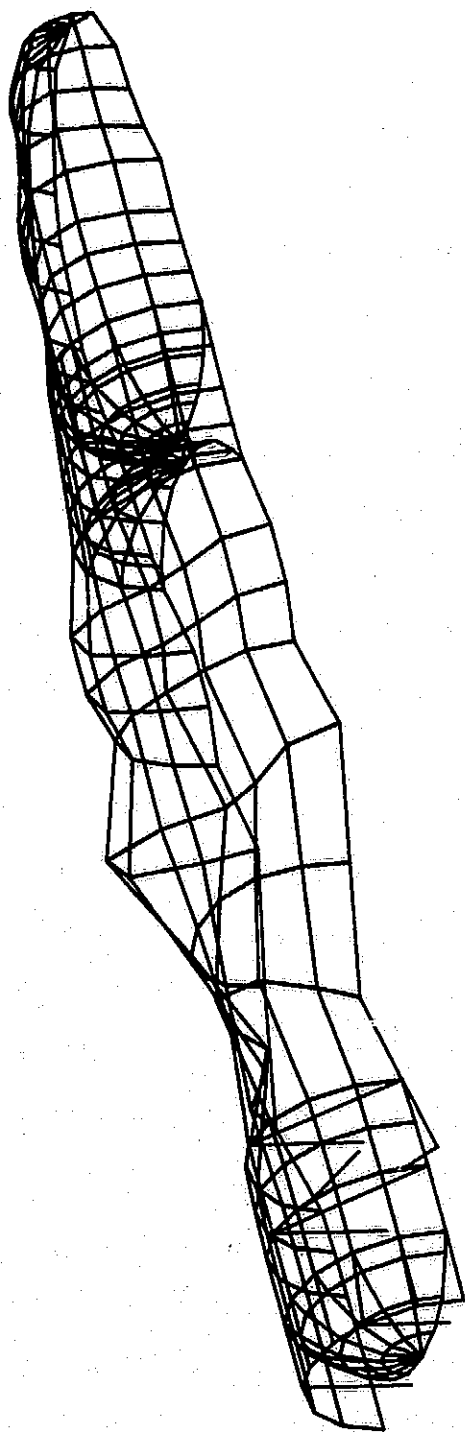


Fig. 3-60 Empty External Tank, Mode 10

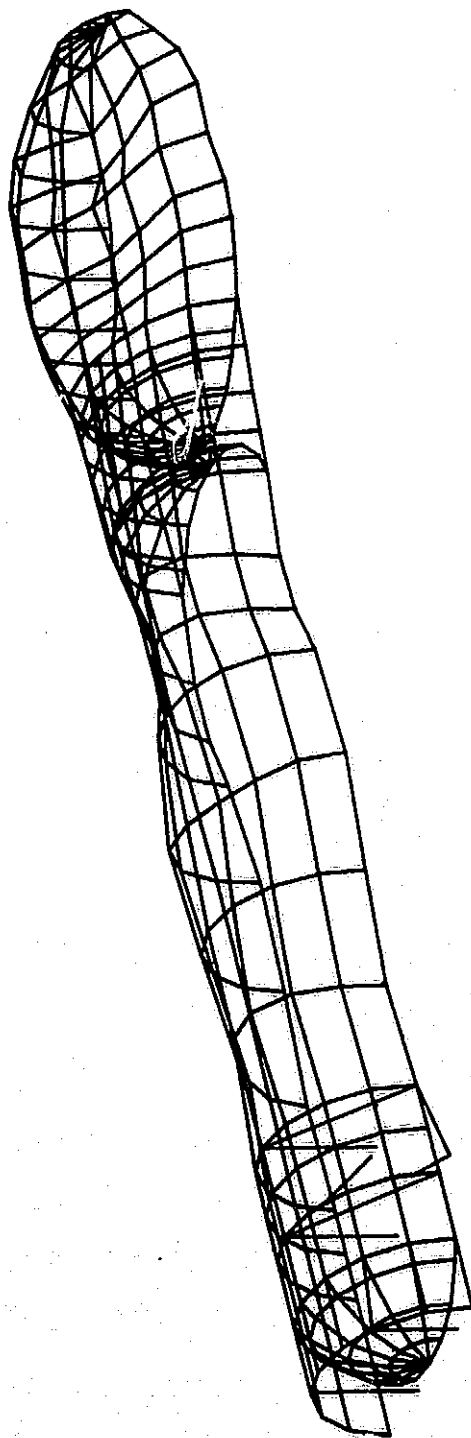


Fig. 3-61 Empty External Tank, Mode 11

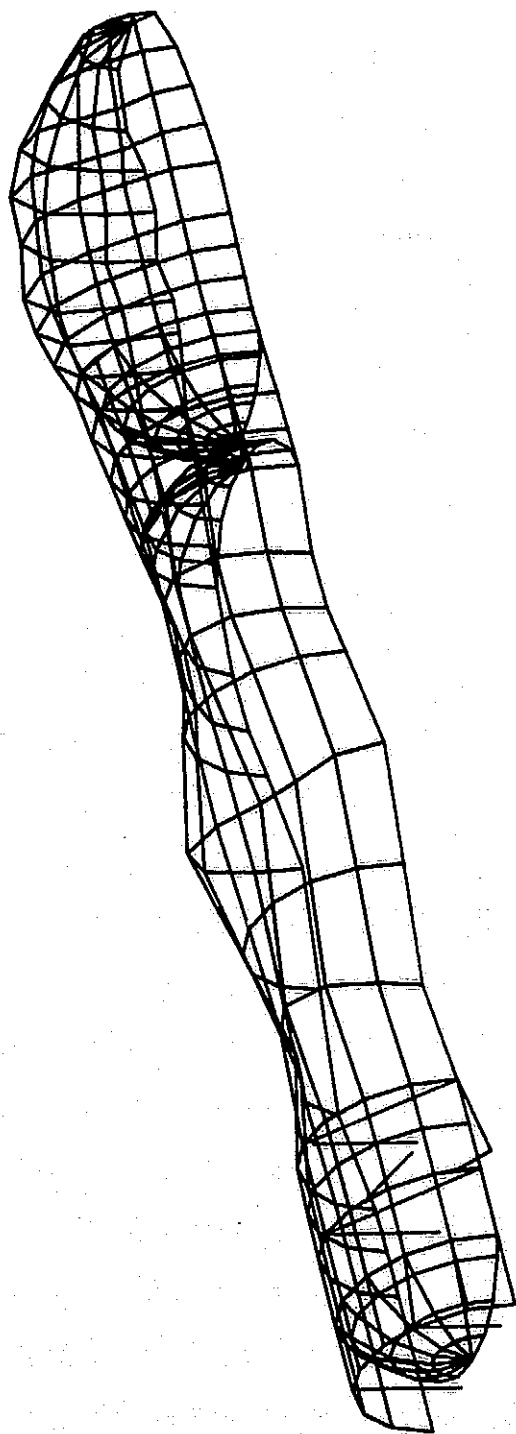


Fig. 3-62 Empty External Tank, Mode 12

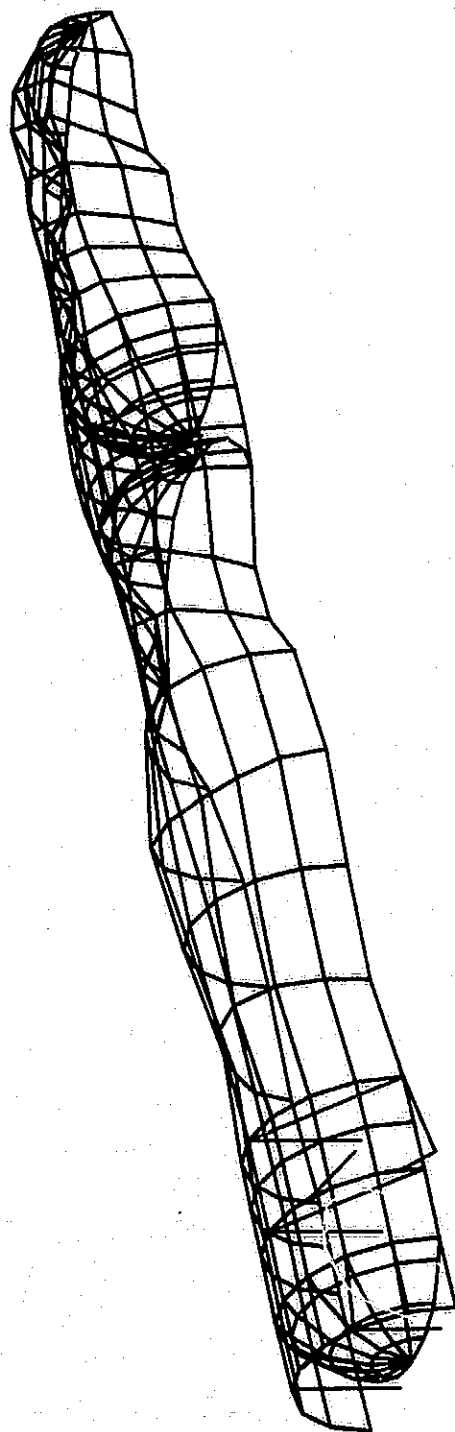


Fig. 3-63 Empty External Tank, Mode 13

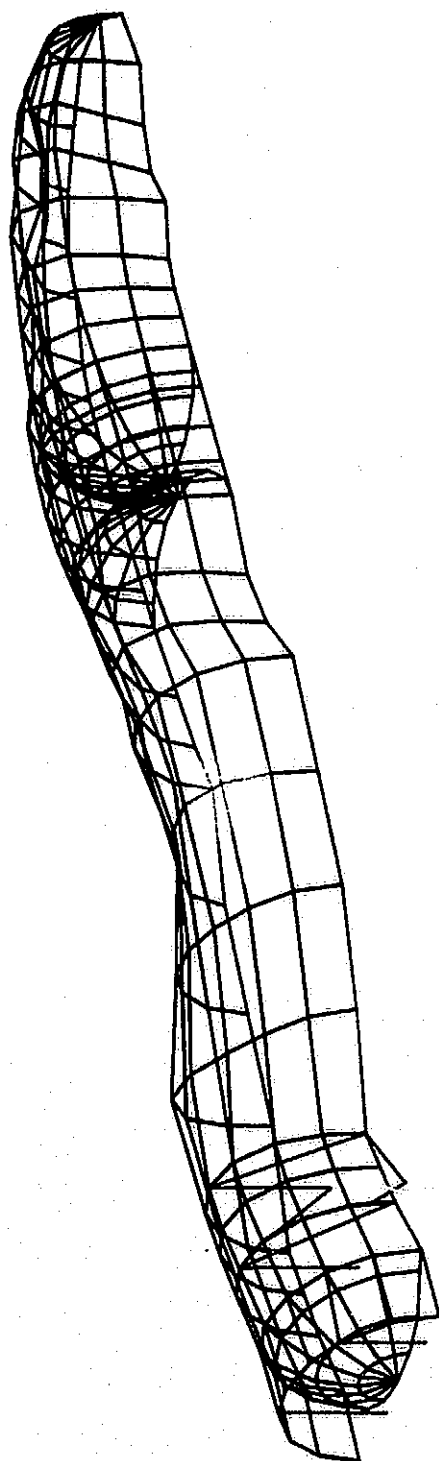


Fig. 3-64 Empty External Tank, Mode 14

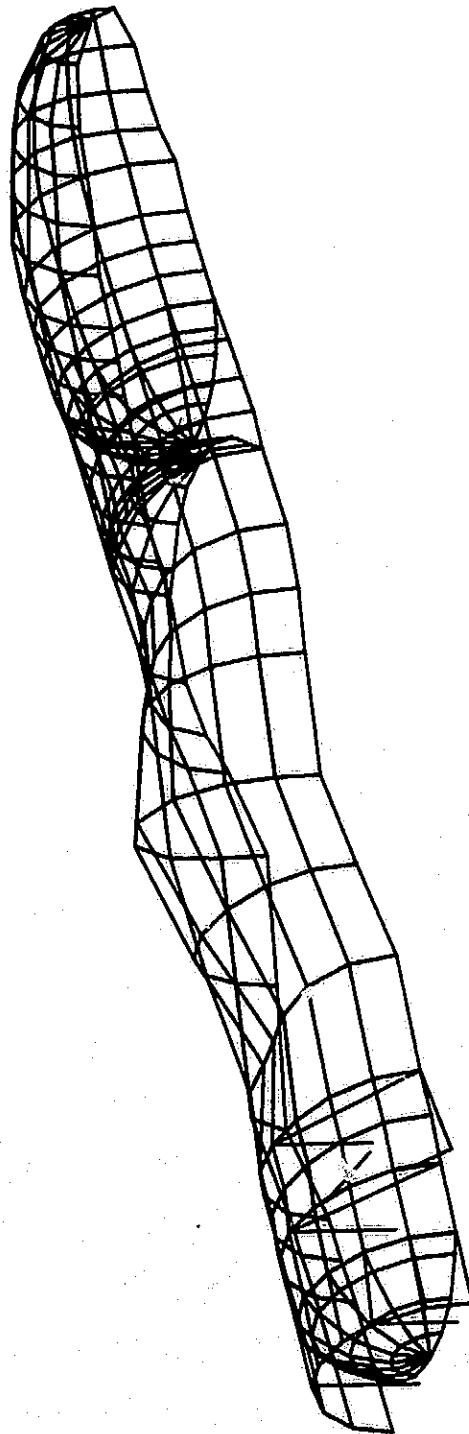


Fig. 3-65 Empty External Tank, Mode 15

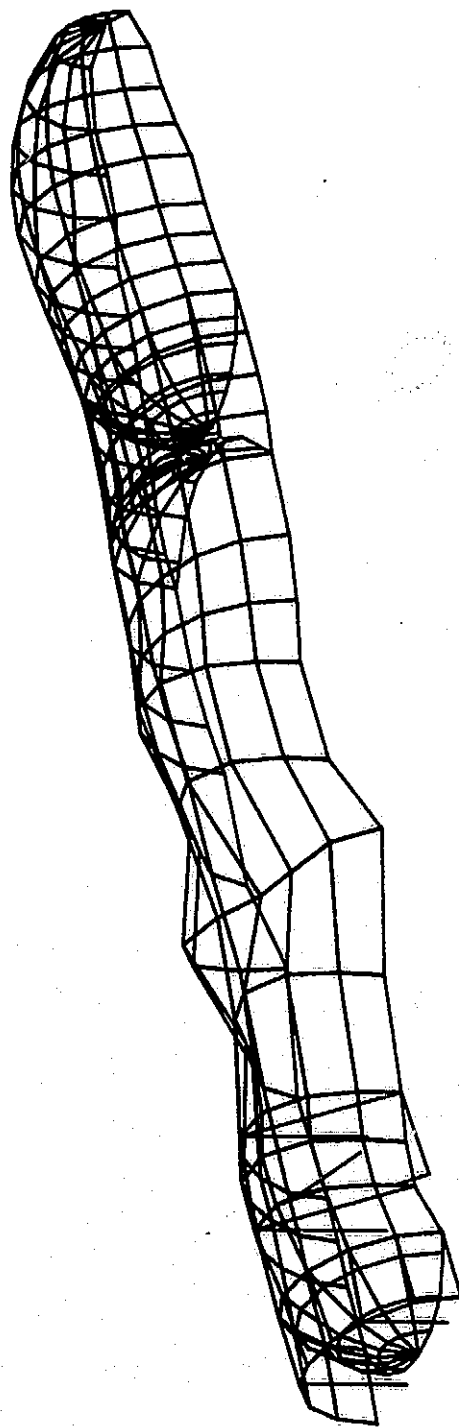


Fig. 3-66 Empty External Tank, Mode 16

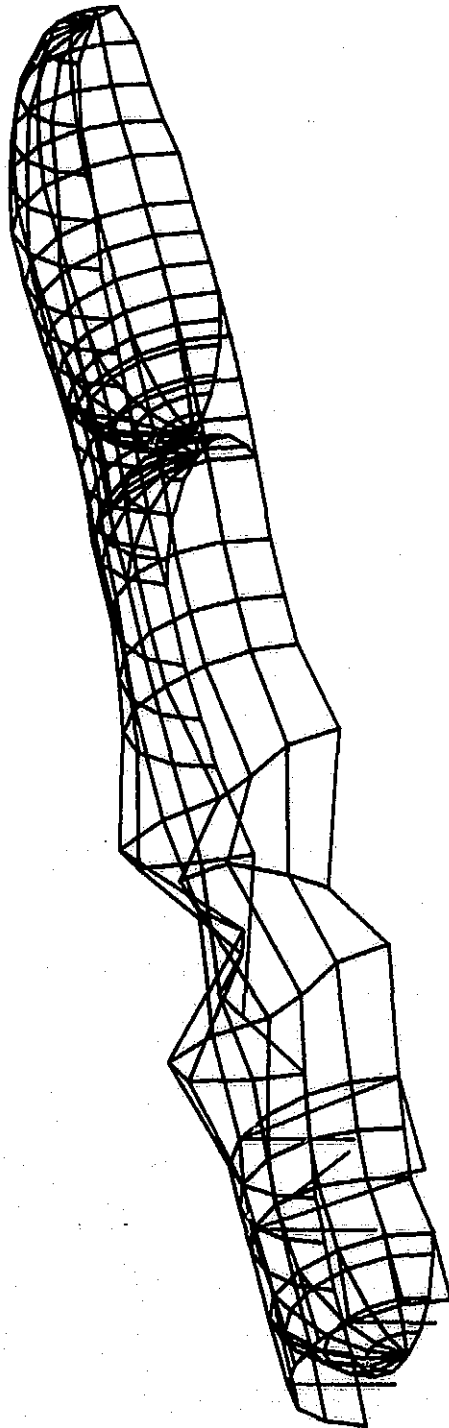


Fig. 3-67 Empty External Tank, Mode 17

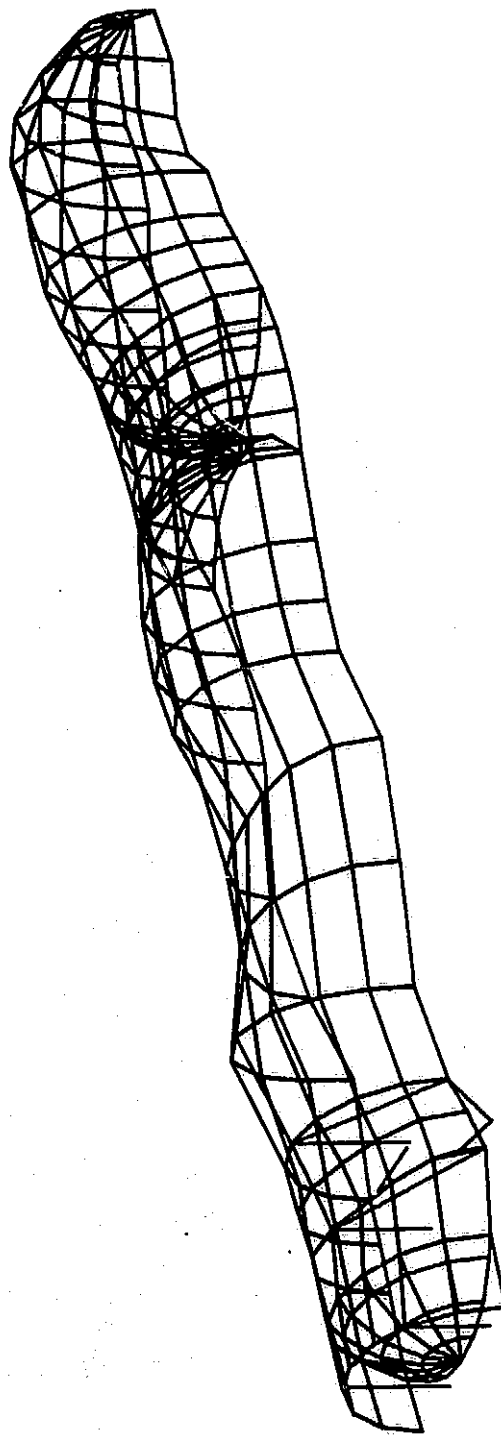


Fig. 3-68 Empty External Tank, Mode 18

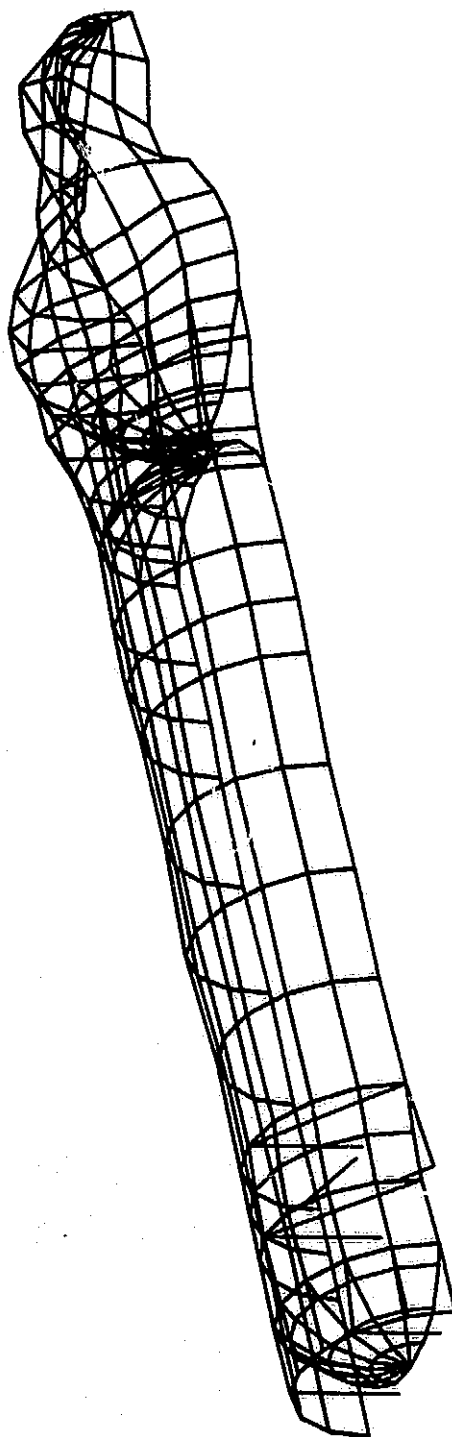


Fig. 3-69 Empty External Tank, Mode 19

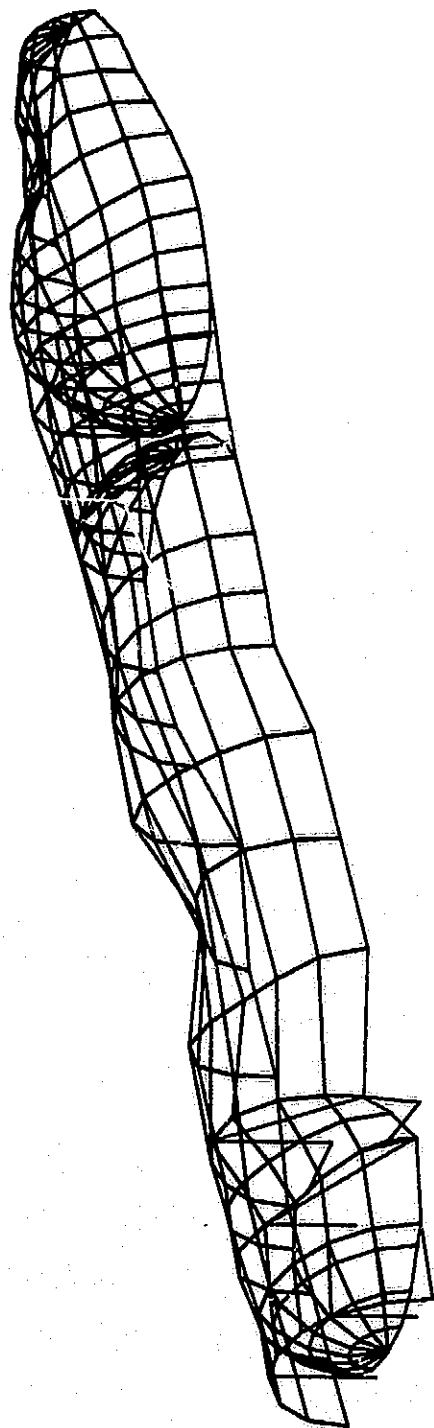


Fig. 3-70 Empty External Tank, Mode 20

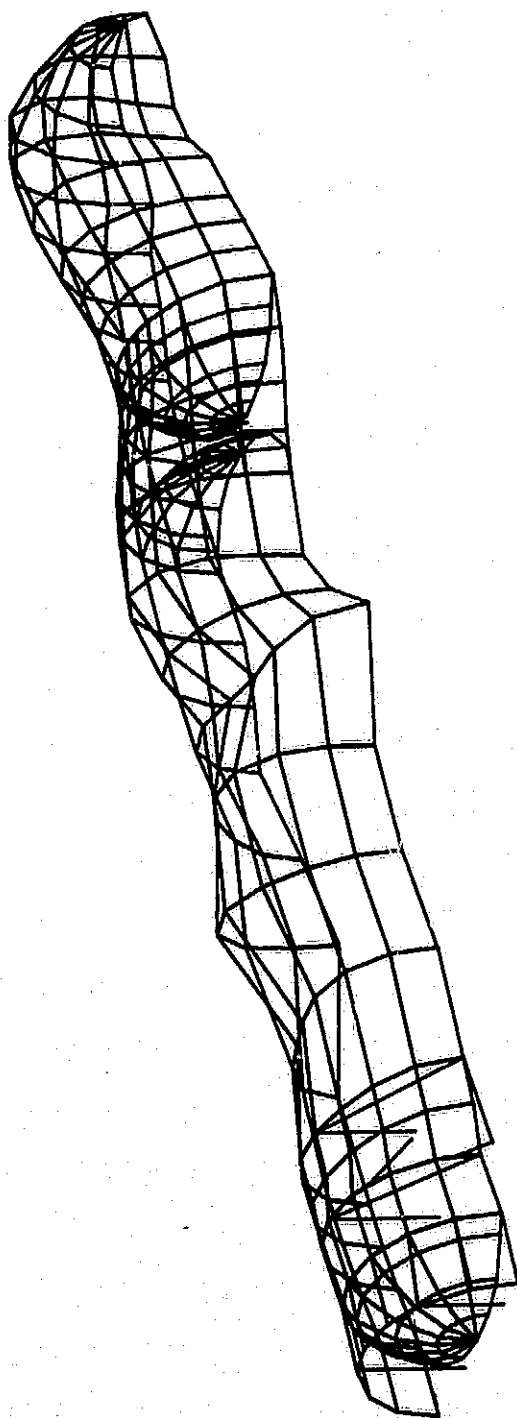


Fig. 3-71 Empty External Tank, Mode 21

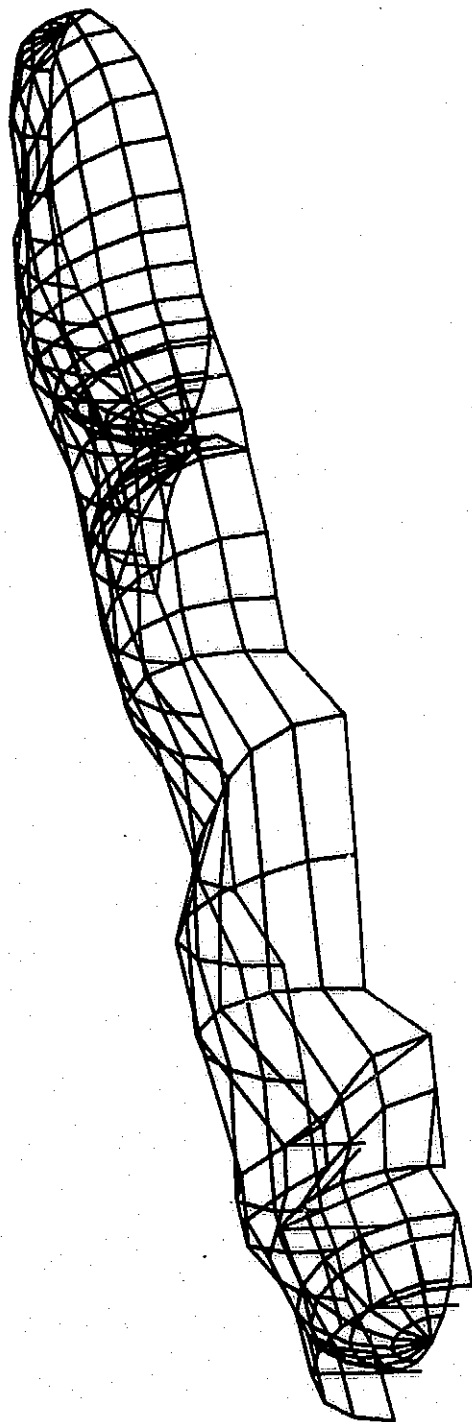


Fig. 3-72 Empty External Tank, Mode 22

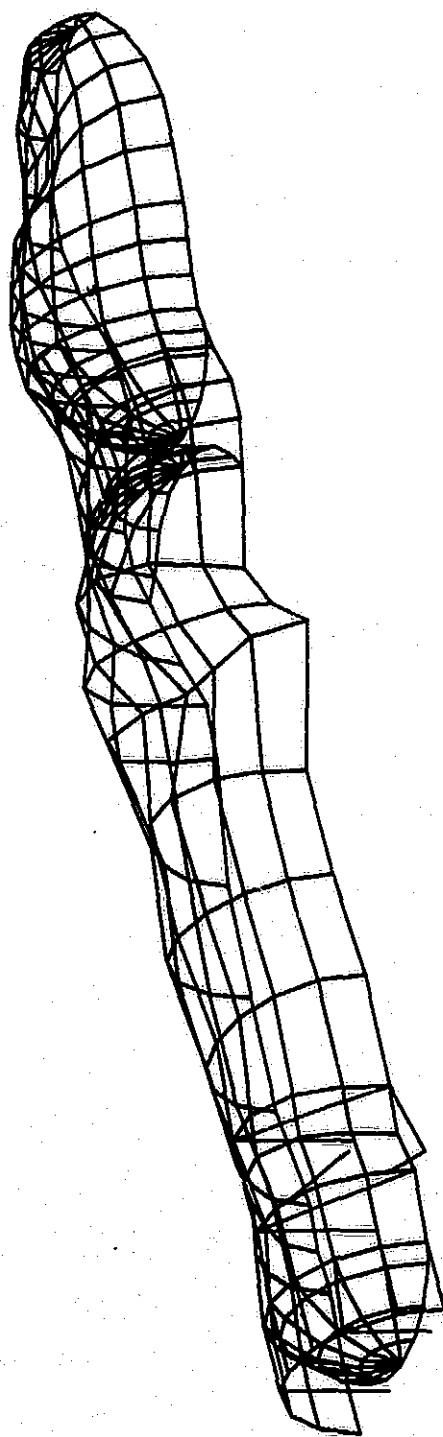


Fig. 3-73 Empty External Tank, Mode 23

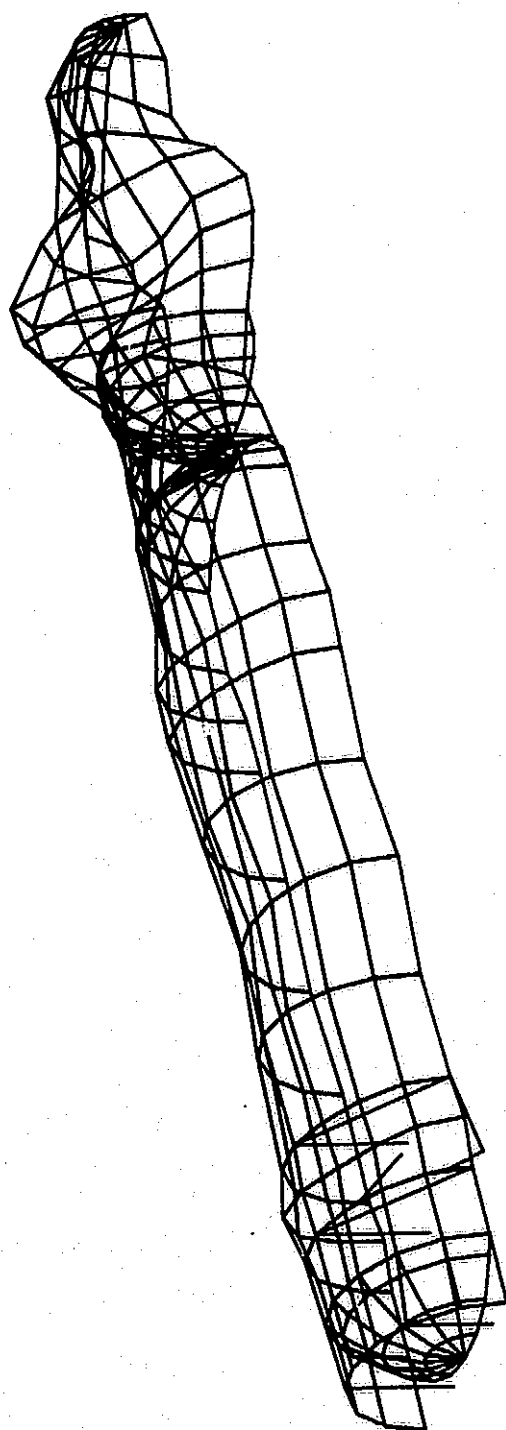


Fig. 3-74 Empty External Tank, Mode 24

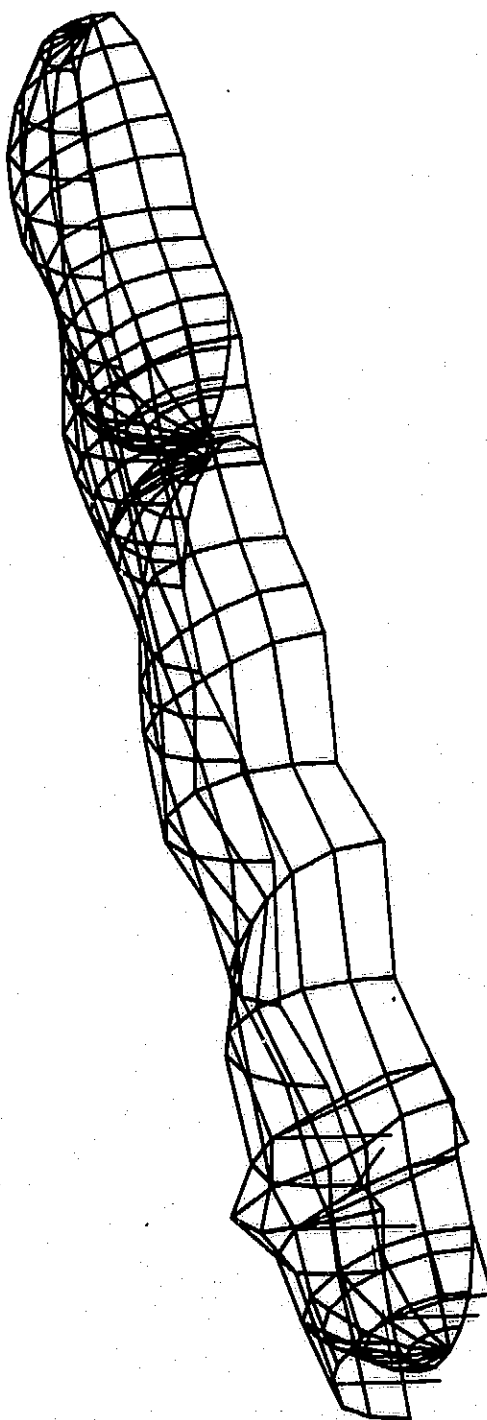
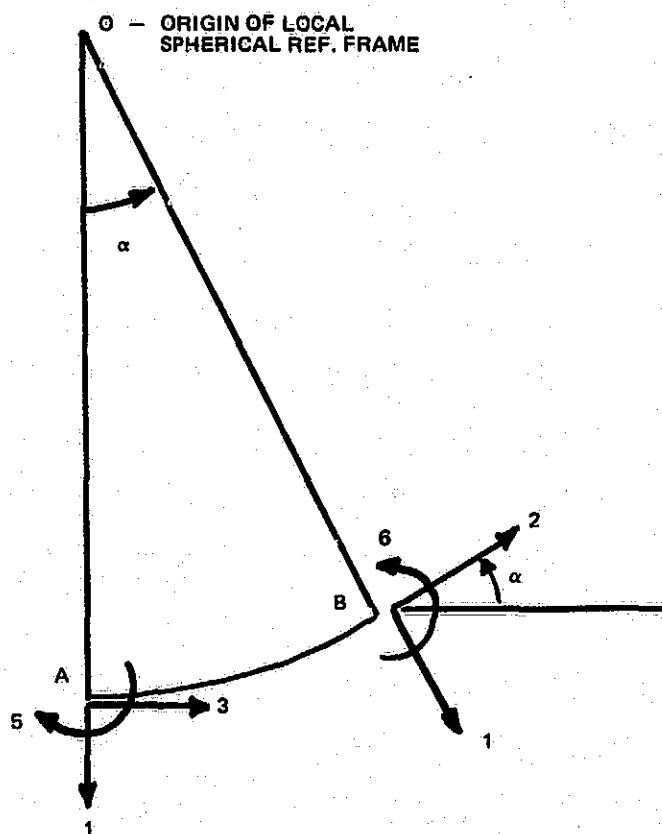


Fig. 3-75 Empty External Tank, Mode 25



• CONSTRAINTS

$$U_{1A} = U_{1B}^0 \cos \alpha - U_{2B}^0 \sin \alpha ;$$

$$U_{6B} = 0; U_{2B}^0 \cos \alpha + U_{1B}^0 \sin \alpha = 0$$

NOTE: SUPERSCRIPT "0" DENOTES ZEROTH HARMONIC.

Figure 3-76 Zeroth Harmonic "Apex Fix"

Table 3-4 Summary of 1/8-Scale External Tank Analysis/Test Comparisons

| Fill Condition | Mode | Frequency (HZ) | | | Beam |
|---|------------------|----------------|-----------------|------------------|-------|
| | | Test | Current NASTRAN | Previous NASTRAN | |
| ● Lift Off | 1st Z Bending | -- | 35.7 | 45.2* | 30 |
| | 1st Axial | -- | 29.7 | 45.2* | 41.4 |
| | 2nd Z Bending | -- | 63.8 | -- | 59.2 |
| ● Post Max Q | 1st Z Bending | 37 | 49.2 | -- | 40.5 |
| | 1st Axial | 49 | 51.8 | -- | 40 |
| | 2nd Z Bending | 102.4 | | | |
| ● Empty | 1st Z Bending | 89 | 105.6 | 104.3** | 94 |
| | LH2 Cylinder n=3 | -- | 153 | 151.6** | -- |
| | 2nd Z Bending | 184.8 | 226 | -- | 243.8 |
| *Extreme Guyan Reduction. In the current NASTRAN analysis, the second axial mode, from Table 3-1 occurs at 54.9 Hz. | | | | | |
| **Inverse Power, No Reductions | | | | | |

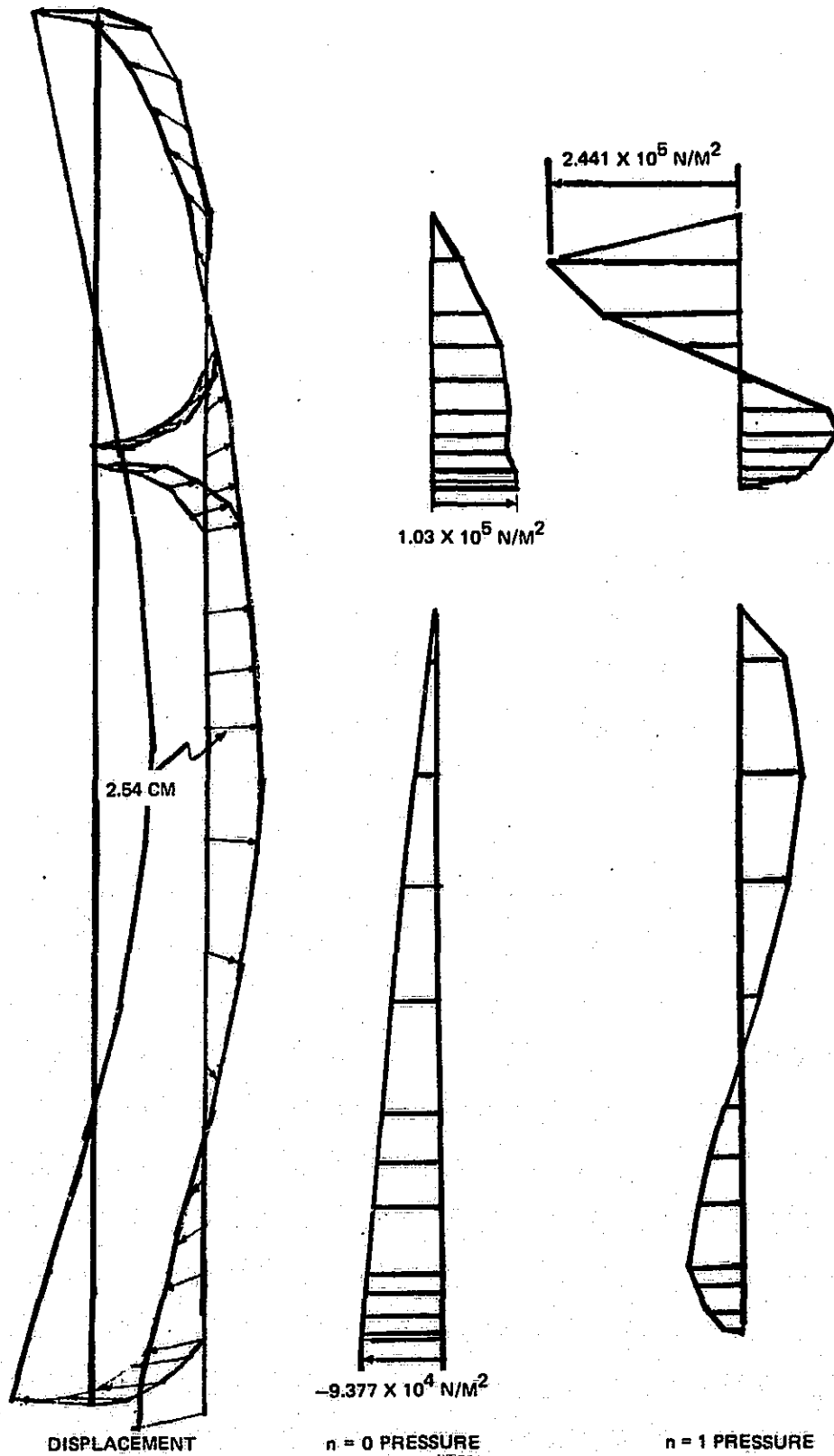


Fig. 3-77 Post Max Q External Tank First Bending Mode (Mode 6) with Modal Pressures

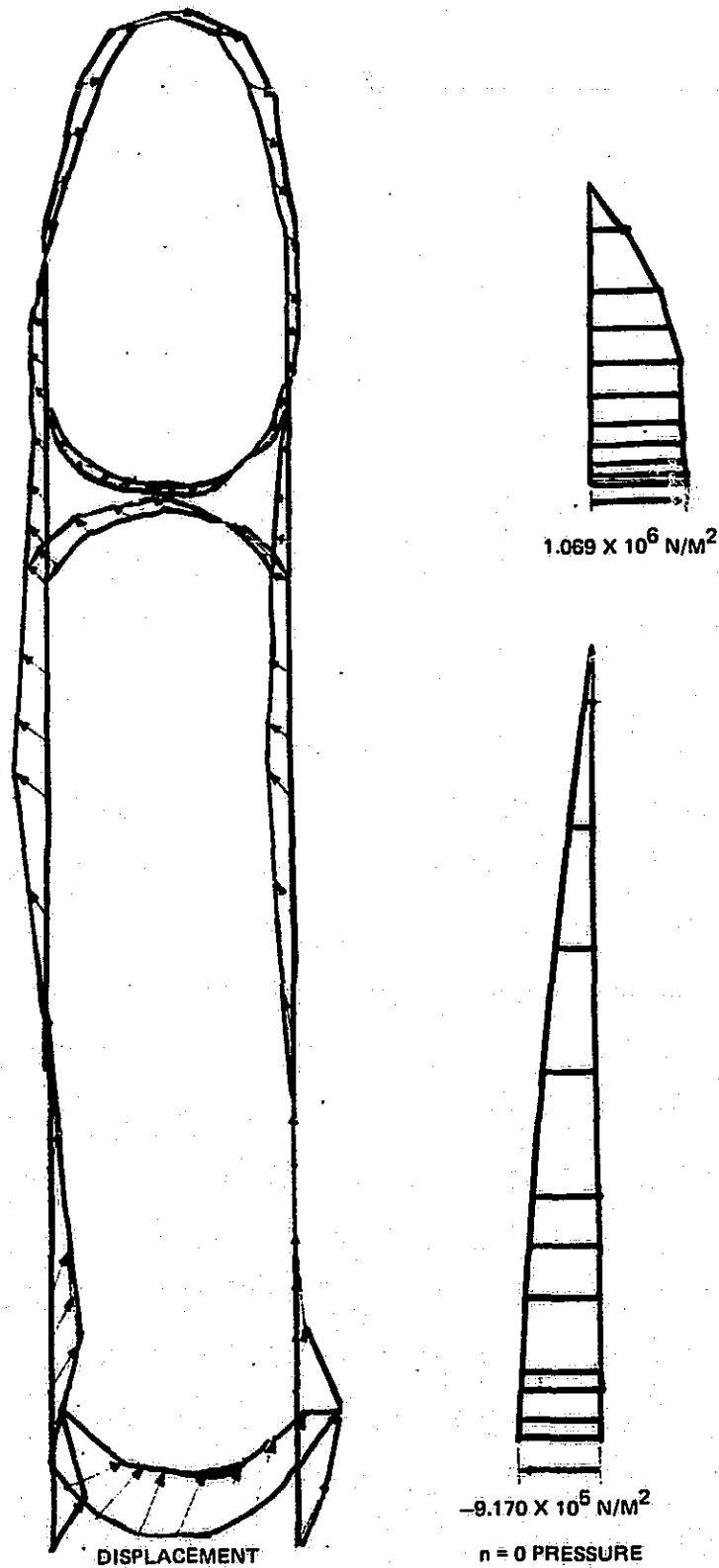
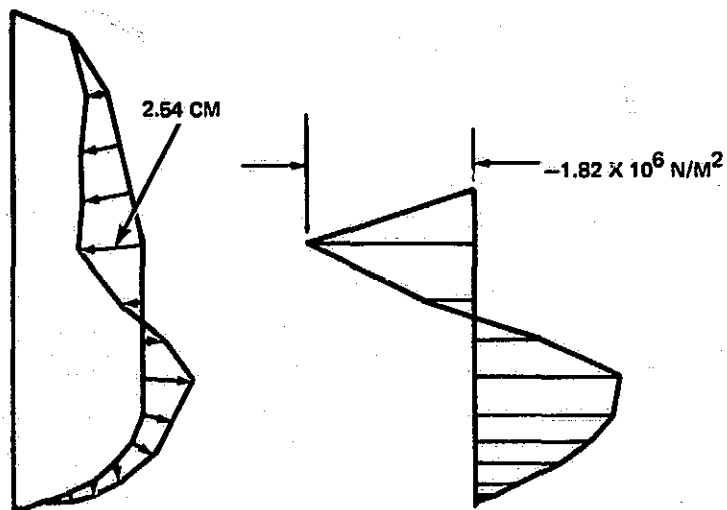
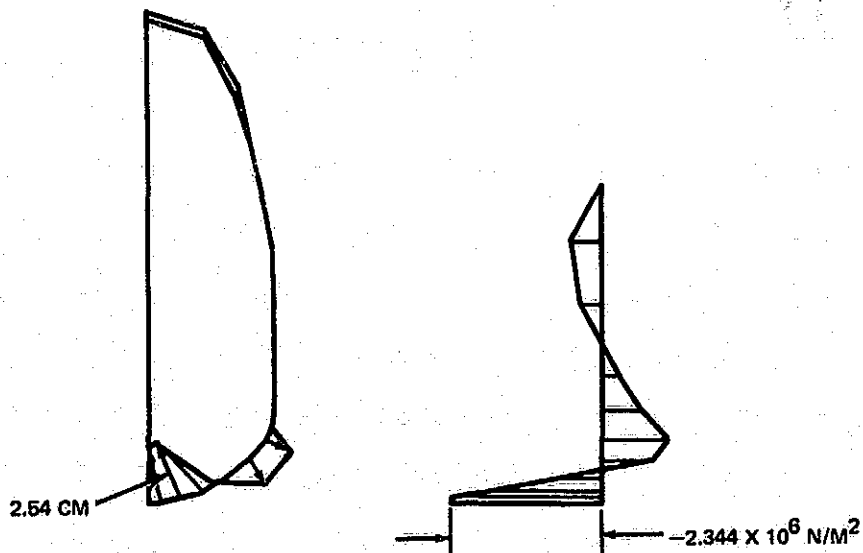


Fig. 3-78 Post Max Q External Tank First Axial Mode (Mode 7) with Modal Pressures

II

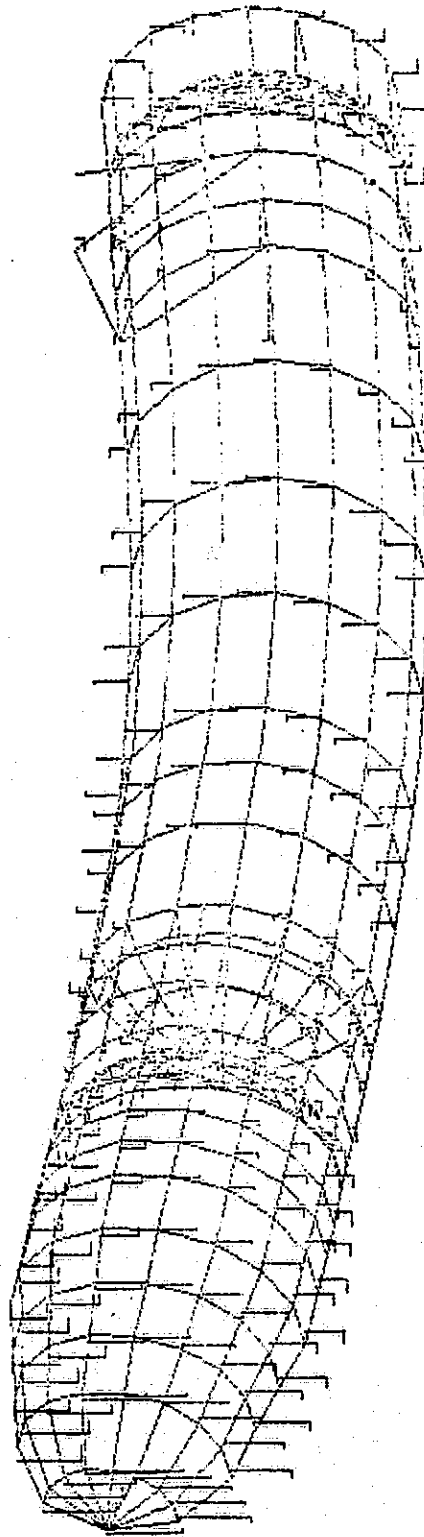


(A) LOX N = 2 "NO DOME" (MODE 12)



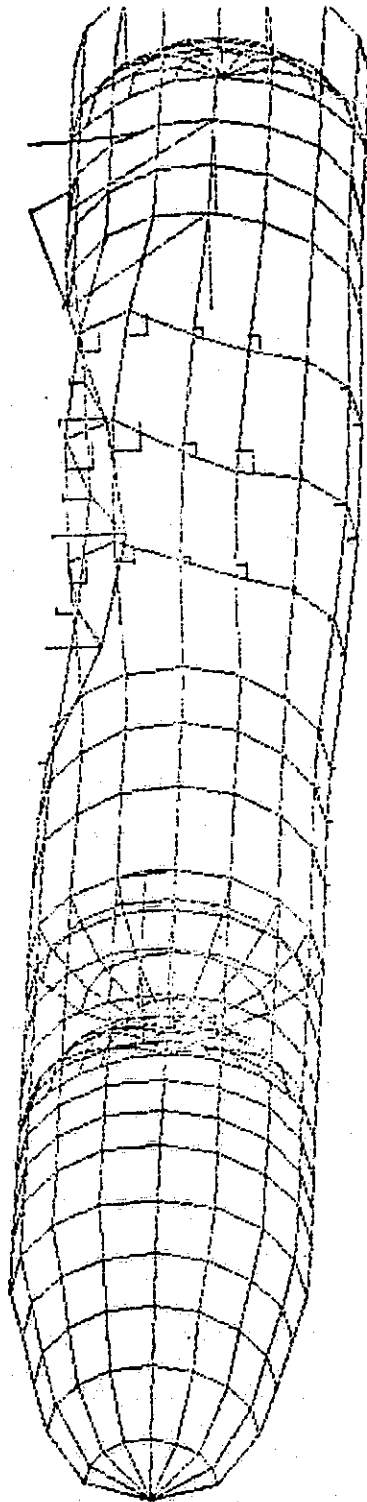
(B) LOX N = 0 "DOME" (MODE 14)

Fig. 3-79 Two Post Max Q External Tank Modes with Modal Pressure (LO₂ Tank Illustrated)



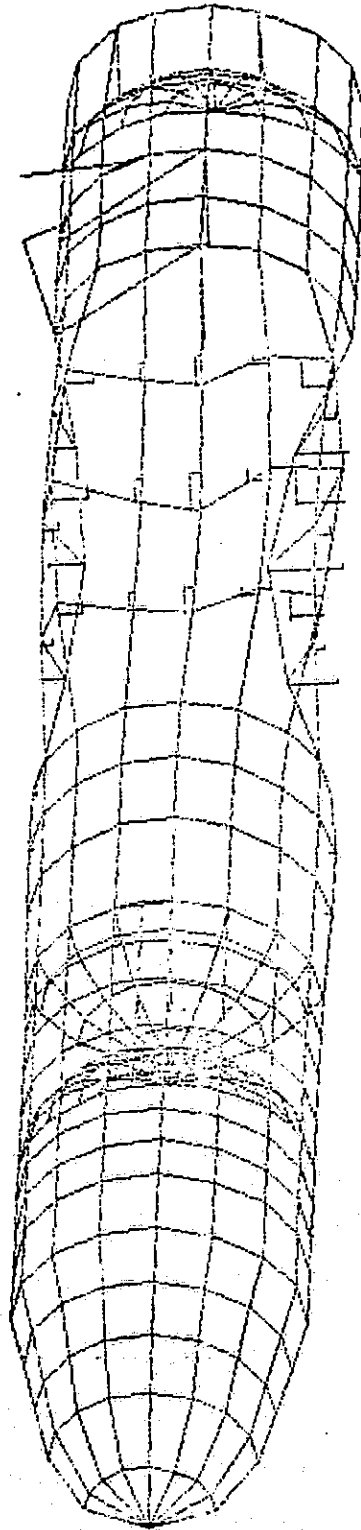
$f = 104.3752 \text{ HZ}$

Fig. 3-80 Empty External Tank, Mode 1 (1st Bending) Calculated with No Reductions



$f = 151.6242 \text{ HZ}$

Fig. 3-81 Empty External Tank Mode 2 (LH₂ Cylinder n = 3) Calculated with No Reductions



$f = 154.2074 \text{ HZ}$

Fig. 3-82 Empty External Tank, Mode 3 (LH₂ Cylinder $n = 4$) Calculated with No Reductions

APPENDIX A - "HARM" - A FORTRAN PROGRAM FOR AUTOMATIC HARMONIC MULTIPOINT CONSTRAINT DATA GENERATION

The FORTRAN IV computer program listing presented in Fig. A-1 has been written to aid the analyst in preparation of harmonic transformation data required in Rigid Format 7 fluid matrix data calculations and in Rigid Format 3 or 13 hydro-elastic normal modes calculations. The harmonic transformations are limited to descriptions of symmetric dynamics of geometrically axisymmetric bodies. The author has utilized this program on the Grumman Calldata time sharing system. On this system input data was prepared on a file, FTO4F001 and the output data was placed on a file FTO7F001 (note the read and write parameters 4 and 7 respectively, in the listing). The output file is punched onto cards and listed in typical runs.

The input data for "HARM" is as follows:

NH = number of harmonics

NPT = number of grid points to be transformed

NFS = parameter -

if = 0 transform only the "1" degree of freedom (the radial)
and

if \neq 0 transform all 6 degrees of freedom.

KHARM (I), I = 1, NH: harmonic numbers to be included.

For each of the "NPT" grid points, the following input data is required:

NGR\ = grid point identification number

NROW = meridional row number associated with the grid point; convention
chosen by analyst

THET = circumferential location of grid point in degrees

NTYP = parameter identifying reference frame type -

= 1 (cylindrical reference frame)

= 2 (local spherical reference frame)

It should be noted that harmonic grid point identification numbers, KH (I), following the convention $KH(I) = 1000000 + 100 * NROW + KHARM(I)$ are generated by "HARM". The analyst should separately prepare GRID or GRIDB cards for NASTRAN bulk data.

```

DIMENSION KHA=H(10),KH(10)
READ(6,10)NH,NPT,NFS
10 FORMAT(9X,3I0)
READ(6,20) (KHARM(I),I=1,NH)
20 FORMAT(9X,7I0)
NH1=NH-1
NH2=NH1/2
NH3=NH1-2*NH2
DO 1000 K9=1,NPT
  READ(6,100) NSP,NPDW,THET,NTYP
  100 FORMAT(9X,19,18,F9.3,10)
  THET=THET/57.2958
  DO 120 I=1,NH
    K4(I)=100000+100*NPDW+KHARM(I)
    IF(NTYP.EQ.2) GO TO 500
    J=1
    A=KHARM(I)*THET
    NP=KH(I)
    CS1=COS(A)
    SN1=SIN(A)
    NC1=100*NGC+11
    L=1
    WRITE(7,110) NGP,L,NB,L,CS1,NC1
    110 FORMAT(10PC,5X,1,7X,2I0,1,5X,2I0,F9.5,9X,1,17)
    IF(NFS.EQ.0) GO TO 29
    L=2
    NC1=100*NGC+12
    WRITE(7,130) NGP,L,NB,L,SN1,NC1
    L=3
    NC1=100*NGC+13
    WRITE(7,130) NGP,L,NB,L,CS1,NC1
    L=4
    NC1=100*NGC+14
    WRITE(7,130) NGP,L,NB,L,SN1,NC1
    L=5
    NC1=100*NGC+15
    WRITE(7,130) NGP,L,NB,L,CS1,NC1
    L=6
    NC1=100*NGC+16
    WRITE(7,130) NGP,L,NB,L,SN1,NC1
    29 CONTINUE
    IF(NH1.EQ.0) GO TO 1000
    IF(NH2.EQ.0) GO TO 300
    DO 200 J=1,NH2
      J1=2*J
      J2=J1+1
      A=KHARM(J1)*THET
      CS1=COS(A)
      SN1=SIN(A)
      A=KHARM(J2)*THET
      CS2=COS(A)
      SN2=SIN(A)
      NP1=KH(J1)
      NP2=KH(J2)
      L=1

```

HARM0010
 HARM0020
 HARM0030
 HARM0040
 HARM0050
 HARM0060
 HARM0070
 HARM0080
 HARM0090
 HARM0100
 HARM0110
 HARM0120
 HARM0130
 HARM0140
 HARM0150
 HARM0160
 HARM0170
 HARM0180
 HARM0190
 HARM0200
 HARM0210
 HARM0220
 HARM0230
 HARM0240
 HARM0250
 HARM0260
 HARM0270
 HARM0280
 HARM0290
 HARM0300
 HARM0310
 HARM0320
 HARM0330
 HARM0340
 HARM0350
 HARM0360
 HARM0370
 HARM0380
 HARM0390
 HARM0400
 HARM0410
 HARM0420
 HARM0430
 HARM0440
 HARM0450
 HARM0460
 HARM0470
 HARM0480
 HARM0490
 HARM0500
 HARM0510
 HARM0520
 HARM0530
 HARM0540
 HARM0550

Fig. A-1 "HARM" Fortran Listing (Sheet 1 of 4)

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```

FILEC HARM FORTRAN P) G R U M M A N D A T A S Y S T E M S
-----
NC1=100*NGR+100*J+1
NC2=100*NGR+100*(J+1)+1
WRITE(7,150) NC1,NB1,L,CS1,NB2,L,CS2,NC2
150 FORMAT('...',17.8X,21B,F8.5,21B,F8.5,8X,'...',17)
IF(NF5.EQ.0) GO TO 200
L=2
NC1=NC1+1
NC2=NC2+1
WRITE(7,150) NC1,NB1,L,SN1,NB2,L,SN2,NC2
L=3
NC1=NC1+1
NC2=NC2+1
WRITE(7,150) NC1,NB1,L,CS1,NB2,L,CS2,NC2
L=4
NC1=NC1+1
NC2=NC2+1
WRITE(7,150) NC1,NB1,L,SN1,NB2,L,SN2,NC2
L=5
NC1=NC1+1
NC2=NC2+1
WRITE(7,150) NC1,NB1,L,CS1,NB2,L,CS2,NC2
L=6
NC1=NC1+1
NC2=NC2+1
WRITE(7,150) NC1,NB1,L,SN1,NB2,L,SN2,NC2
200 CONTINUE
300 CONTINUE
IF(NH3.EQ.0) GO TO 1000
A=KHAM(NH)*THEY
NR=KH(NH)
CS1=CSH(A)
TUI=TH(A)
L=1
NC1=100*NGR+100*J+1
WRITE(7,150) NC1,NB,L,CS1
150 FORMAT('...',16.8X,21B,F8.5)
IF(NF5.EQ.0) GO TO 1000
L=2
NC1=NC1+1
WRITE(7,150) NC1,NB,L,SN1
L=3
NC1=NC1+1
WRITE(7,160) NC1,NB,L,CS1
L=4
NC1=NC1+1
WRITE(7,160) NC1,NB,L,SN1
L=5
NC1=NC1+1
WRITE(7,160) NC1,NB,L,CS1
L=6
NC1=NC1+1
WRITE(7,160) NC1,NB,L,SN1
300 CONTINUE
500 CONTINUE

```

Fig. A-1 "HARM" Fortran Listing (Sheet 2 of 4)

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```

J=1
A=KXAR(1)*THET
H=CH(1)
CS1=CSIA)
SN1=SNIA)
NC1=100*NGR+11
L=1
WRITE(7,130) NGR,L,NB,L,CS1,NC1
130 FORMAT(7,F7.0,0160 TO 229
L=2
NC1=100*NGR+12
WRITE(7,130) NGR,L,NB,L,CS1,NC1
L=3
NC1=100*NGR+13
WRITE(7,130) NGR,L,NB,L,SN1,NC1
L=4
NC1=100*NGR+14
WRITE(7,130) NGR,L,NB,L,SN1,NC1
L=5
NC1=100*NGR+15
WRITE(7,130) NGR,L,NB,L,SN1,NC1
L=6
NC1=100*NGR+16
WRITE(7,130) NGR,L,NB,L,CS1,NC1
229 CONTINUE
131(3H,50.0) GO TO 1000
132(3H,50.0) GO TO 300
GO TO 30 J=1,N2
J1=J+1
J2=J+1
A=KXAR(J1)*THET
CS1=CSIA)
SN1=SNIA)
A=KXAR(J2)*THET
CS2=CSIA)
SN2=SNIA)
NC1=100*NGR+10*J+1
NC2=100*NGR+10*J+1
WRITE(7,150) NC1,NB1,L,CS1,NB2,L,CS2,NC2
150 FORMAT(5,F7.0,01 TO 700
L=2
NC1=NC1+1
NC2=NC2+1
WRITE(7,150) NC1,NB1,L,CS1,NB2,L,CS2,NC2
L=3
NC1=NC1+1
NC2=NC2+1
WRITE(7,150) NC1,NB1,L,SN1,NB2,L,SN2,NC2
L=4
NC1=NC1+1
NC2=NC2+1
WRITE(7,150) NC1,NB1,L,SN1,NB2,L,SN2,NC2

```

Fig. A-1 "HARM" Fortran Listing (Sheet 3 of 4)

```

FILED NAME      FORTRAN DE      GR U M M A N   D A T A   S Y S T E M S

L=5
NCI=NC1+1
NC2=NC2+1
WRITE(7,150) NCI,NB1,L,SNI,NB2,L,SN2,NC2
L=6
NCI=NC1+1
NC2=NC2+1
WRITE(7,150) NCI,NB1,L,CSI,NB2,L,CS2,NC2
700 CONTINUE
1000
10(NB3,50.0) GO TO 1000
800 CONTINUE
A=KHACH(NH)*THET
NACH(NH)
CSI=CS(A)
SNI=SI(A)
L=1
NCI=100*NSP+100+1
WRITE(7,160) NCI,NB,L,CSI
10(NB,50.0) GO TO 1000
L=2
NCI=NC1+1
WRITE(7,160) NCI,NB,L,CSI
L=3
NCI=NC1+1
WRITE(7,160) NCI,NB,L,SN1
L=4
NCI=NC1+1
WRITE(7,160) NCI,NB,L,SN1
L=5
NCI=NC1+1
WRITE(7,160) NCI,NB,L,SN1
L=6
NCI=NC1+1
WRITE(7,160) NCI,NB,L,CSI
1000 CONTINUE
STOP
END

```

HAF01560
HAF01570
HAF01580
HAF01590
HAF01700
HAF01710
HAF01720
HAF01730
HAF01740
HAF01750
HAF01760
HAF01770
HAF01780
HAF01790
HAF01800
HAF01910
HAF01920
HAF01930
HAF01940
HAF01950
HAF01960
HAF01970
HAF01980
HAF01990
HAF02000
HAF02010
HAF02020
HAF02030

Fig. A-1 "HARM" Fortran Listing (Sheet 4 of 4)

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N A - T R A N E X E C U T I V E C O N T R O L D E C K E C H O

ID HYDRO.COPPOLINO

APP DISP

SOL 7.0

TIME 5

CHKPNT YES

DIAG 7.8.13.14.19.21.22

ALTER 50

MATGPR GPL,USET,SIL,MGG//C.N.G

MATGPR GPL,USET,SIL,KGG//C.N.G

ALTER 73

MATGPR GPL,USET,SIL,MFF//C.N.F

MATGPR GPL,USET,SIL,KFF//C.N.F

ALTER 101

MATGPR GPL,USET,SIL,ABFL//C.N.P

MATGPR GPL,USET,SIL,KBFL//C.N.P

ALTER 136

MATGPR GPLD,USETD,SILD,MDD//C.N.D

MATGPR GPLD,USETD,SILD,KDD//C.N.D

SEEMAT MGG,KGG,MFF,KFF,ABFL//C.N.PRINT

SEEMAT KBFL,MDD,KDD,.,./C.N.PRINT

PARTN KDD,P9,KDP,AEM,.,KE/C.N.-1 \$

PARTN KBP,G9,K11,K21,K12,K22/C.N.-1 \$

PARTN AEM,G9,UP,A1M,.,A2M/C.N.1 \$

PARTN KE,UP,KE1,.,KE2/C.N.-1 \$

THNSP A2M/A2MT \$

SOLVE K22,A2MT/PDU2/C.N.1/C.N.-1 \$

SOLVE A1M,K12/M2L/C.N.1 \$

MPYAD M2L,PDU2,TU12/C.N.0/C.N.-1 \$

ADD PDU2,PDU3/C.Y.A999#X1.0.0.0H \$

PAHAM //C.N.NOP/V.N.TRUE=-1 \$

EQUIV PDU3,PDU2/TRUE \$

COND PDUN09,TRUE \$

MATPRN PDU3,.,.,./ \$

LABEL PDUN09 \$

MPYAD A2M,PDU2,MFLD/C.N.0/C.N.-1 \$

OUTPUT3 MFLD,PDU2,TU12,./C.N.0/C.Y.N1/AME/C.Y.N2/APD/C.Y.N3/ATU \$

SMYAD TU12,KE1,TU12,.,KE2/KEB/C.N.3/C.N.1/C.N.2/C.N.1 \$

SOLVE K22,K21/CP2/C.N.1/C.N.-1 \$

MATPRN K11,K12,K22,.,./ \$

MATPRN A1M,A2M,KE1,.,./ \$

MATPRN PDU2,MFLD,TU12,.,./ \$

MATPRN KEB,K11,CP2,.,./ \$

EXIT

ENDALTER

CEND

APRIL 9. 1974 NASTRAN 2/ 1/73

NA TRAN EXECUTIVE CONTROL DELK ECHO

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ECHO OF FIRST CARD IN CHECKPOINT DICTIONARY TO BE PUNCHED OUT FOR THIS PROBLEM

RESTART HYDRO .COPPOLIN. 4/ 9/74. 48911.

CASE CONTROL DECK ECHO

CARD
COUNT

TITLE#CYLINDRICAL FLUID
AXISYM#FLUID
MPC#1
CMETHOD#1
OUTPUT
DISP#ALL
HARMONICS#ALL
BEGIN BULK

1
2
3
4
5
6
7
8

*** USER INFORMATION MESSAGE 207. BULK DATA NOT SORTED. XSORT WILL RE-ORDER DECK. ***

SORTED BULK DATA ECHO

| CARD
COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------------|---------|----|------|----|----|----|----|----|----|------|
| 1- | AXIF | 1 | 0.0 | 1. | | | | | | |
| 2- | CAX | 0 | 2 | 4 | | | | | | |
| 3- | BDYLIST | | AXIS | 1 | 2 | 3 | 4 | 5 | 10 | CRD1 |
| 4- | CRD1 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | CRD2 |
| 5- | CRD2 | 55 | | | | | | | | |
| 6- | GFLUID2 | 1 | 1 | 6 | | | | | | |
| 7- | GFLUID2 | 6 | 6 | 11 | | | | | | |
| 8- | GFLUID2 | 11 | 11 | 16 | | | | | | |
| 9- | GFLUID2 | 16 | 16 | 21 | | | | | | |
| 10- | GFLUID2 | 21 | 21 | 26 | | | | | | |
| 11- | GFLUID2 | 26 | 26 | 31 | | | | | | |
| 12- | GFLUID2 | 31 | 31 | 36 | | | | | | |
| 13- | GFLUID2 | 36 | 36 | 41 | | | | | | |
| 14- | GFLUID2 | 41 | 41 | 46 | | | | | | |
| 15- | GFLUID2 | 46 | 46 | 51 | | | | | | |
| 16- | GFLUID4 | 2 | 1 | 2 | 7 | 6 | | | | |
| 17- | GFLUID4 | 3 | 2 | 3 | 8 | 7 | | | | |
| 18- | GFLUID4 | 4 | 3 | 4 | 9 | 8 | | | | |
| 19- | GFLUID4 | 5 | 4 | 5 | 10 | 9 | | | | |
| 20- | GFLUID4 | 7 | 6 | 7 | 12 | 11 | | | | |
| 21- | GFLUID4 | 8 | 7 | 8 | 13 | 12 | | | | |
| 22- | GFLUID4 | 9 | 8 | 9 | 14 | 13 | | | | |
| 23- | GFLUID4 | 10 | 9 | 10 | 15 | 14 | | | | |
| 24- | GFLUID4 | 12 | 11 | 12 | 17 | 16 | | | | |
| 25- | GFLUID4 | 13 | 12 | 13 | 18 | 17 | | | | |
| 26- | GFLUID4 | 14 | 13 | 14 | 19 | 18 | | | | |
| 27- | GFLUID4 | 15 | 14 | 15 | 20 | 19 | | | | |
| 28- | GFLUID4 | 17 | 16 | 17 | 22 | 21 | | | | |
| 29- | GFLUID4 | 18 | 17 | 18 | 23 | 22 | | | | |
| 30- | GFLUID4 | 19 | 18 | 19 | 24 | 23 | | | | |
| 31- | GFLUID4 | 20 | 19 | 20 | 25 | 24 | | | | |
| 32- | GFLUID4 | 22 | 21 | 22 | 27 | 26 | | | | |
| 33- | GFLUID4 | 23 | 22 | 23 | 28 | 27 | | | | |
| 34- | GFLUID4 | 24 | 23 | 24 | 29 | 28 | | | | |
| 35- | GFLUID4 | 25 | 24 | 25 | 30 | 29 | | | | |
| 36- | GFLUID4 | 27 | 26 | 27 | 32 | 31 | | | | |
| 37- | GFLUID4 | 28 | 27 | 28 | 33 | 32 | | | | |
| 38- | GFLUID4 | 29 | 28 | 29 | 34 | 33 | | | | |
| 39- | GFLUID4 | 30 | 29 | 30 | 35 | 34 | | | | |
| 40- | GFLUID4 | 32 | 31 | 32 | 37 | 36 | | | | |
| 41- | GFLUID4 | 33 | 32 | 33 | 38 | 37 | | | | |
| 42- | GFLUID4 | 34 | 33 | 34 | 39 | 38 | | | | |
| 43- | GFLUID4 | 35 | 34 | 35 | 40 | 39 | | | | |
| 44- | GFLUID4 | 37 | 36 | 37 | 42 | 41 | | | | |
| 45- | GFLUID4 | 38 | 37 | 38 | 43 | 42 | | | | |
| 46- | GFLUID4 | 39 | 38 | 39 | 44 | 43 | | | | |
| 47- | GFLUID4 | 40 | 39 | 40 | 45 | 44 | | | | |
| 48- | GFLUID4 | 42 | 41 | 42 | 47 | 46 | | | | |
| 49- | GFLUID4 | 43 | 42 | 43 | 48 | 47 | | | | |
| 50- | GFLUID4 | 44 | 43 | 44 | 49 | 48 | | | | |

SORTED BULK DATA ECHO

| CARD
COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
|---------------|------------|--------|-----|-----|------|------|-----|-------|----|------|--|
| 51- | CFLUID4 45 | 44 | 45 | 50 | 49 | | | | | | |
| 52- | CFLUID4 47 | 46 | 47 | 52 | 51 | | | | | | |
| 53- | CFLUID4 48 | 47 | 48 | 53 | 52 | | | | | | |
| 54- | CFLUID4 49 | 48 | 49 | 54 | 53 | | | | | | |
| 55- | CFLUID4 50 | 49 | 50 | 55 | 54 | | | | | | |
| 56- | CORD2C 1 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | | ECDC | |
| 57- | ECDC 1 | 0. | 0. | | | | | | | | |
| 58- | DM1 | 0 | 2 | 1 | 2 | | | 45 | 1 | | |
| 59- | DM1 | 0 | 16 | 1. | 1. | 1. | 1. | 1. | 1. | EPPI | |
| 60- | EPPI | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | EPPI | |
| 61- | EPPI | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | EPPI | |
| 62- | EPPI | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | EPPI | |
| 63- | EPPI | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | EPPI | |
| 64- | DM1 | P9 | 0 | 2 | 1 | 2 | | 90 | 1 | | |
| 65- | DM1 | P9 | 1 | 46 | 1. | 1. | 1. | 1. | 1. | EPPI | |
| 66- | EPPI | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | EPPI | |
| 67- | EPPI | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | EPPI | |
| 68- | EPPI | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | EPPI | |
| 69- | EPPI | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | EPPI | |
| 70- | EPPI | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | EPPI | |
| 71- | DM1 | UP | 0 | 2 | 1 | 2 | | 45 | 1 | | |
| 72- | DM1 | UP | 1 | 16 | 1. | 1. | 1. | 1. | 1. | EPPI | |
| 73- | EPPI | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | EPPI | |
| 74- | EPPI | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | EPPI | |
| 75- | EPPI | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | EPPI | |
| 76- | EPPI | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | EPPI | |
| 77- | EPPI | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | EPPI | |
| 78- | EPPI | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | EPPI | |
| 79- | FLSYM | 4 | 0. | 0. | 500. | -001 | 10 | 10 | | EPPI | |
| 80- | FLSYM | 4 | 0. | 0. | 500. | -001 | 10 | 10 | | EPPI | |
| 81- | GRID | 100600 | 1 | 1. | 0.0 | 0.0 | 1 | 12456 | | | |
| 82- | GRID | 100602 | 1 | 1. | 0.0 | 0.0 | 1 | 12456 | | | |
| 83- | GRID | 100604 | 1 | 1. | 0.0 | 0.0 | 1 | 12456 | | | |
| 84- | GRID | 100700 | 1 | 1. | 0.0 | 0.0 | 1 | 12456 | | | |
| 85- | GRID | 100702 | 1 | 1. | 0.0 | 0.0 | 1 | 12456 | | | |
| 86- | GRID | 100704 | 1 | 1. | 0.0 | 0.0 | 1 | 12456 | | | |
| 87- | GRID | 100800 | 1 | 1. | 0.0 | 0.0 | 1 | 12456 | | | |
| 88- | GRID | 100802 | 1 | 1. | 0.0 | 0.0 | 1 | 12456 | | | |
| 89- | GRID | 100804 | 1 | 1. | 0.0 | 0.0 | 1 | 12456 | | | |
| 90- | GRID | 100900 | 1 | 1. | 0.0 | 0.0 | 1 | 12456 | | | |
| 91- | GRID | 100902 | 1 | 1. | 0.0 | 0.0 | 1 | 12456 | | | |
| 92- | GRID | 100904 | 1 | 1. | 0.0 | 0.0 | 1 | 12456 | | | |
| 93- | GRID | 101000 | 1 | 1. | 0.0 | 0.0 | 1 | 12456 | | | |
| 94- | GRID | 101002 | 1 | 1. | 0.0 | 0.0 | 1 | 12456 | | | |
| 95- | GRID | 101004 | 1 | 1. | 0.0 | 0.0 | 1 | 12456 | | | |
| 96- | GRID | 102000 | 1 | 1. | 0.0 | 0.0 | 1 | 23456 | | | |
| 97- | GRID | 102002 | 1 | 1. | 0.0 | 0.0 | 1 | 23456 | | | |
| 98- | GRID | 102004 | 1 | 1. | 0.0 | 0.0 | 1 | 23456 | | | |
| 99- | GRID | 103000 | 1 | 1. | 0.0 | 0.0 | 1 | 23456 | | | |
| 100- | GRID | 103002 | 1 | 1. | 0.0 | 0.0 | 1 | 23456 | | | |
| | GRID | 103004 | 1 | 1. | 0.0 | 0.0 | 1 | 23456 | | | |

APRIL 9, 1974 NASTRAN 2/ 1773

CYLINDRICAL FLUID

SORTED BULK DATA ECHO

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|------|--------|---|----|-----|-----|---|-------|---|----|
| COUNT | GRID | | | | | | | | | |
| 101- | GRID | 104000 | 1 | 1. | 0.0 | 0.0 | 1 | 23456 | | |
| 102- | GRID | 104002 | 1 | 1. | 0.0 | 0.0 | 1 | 23456 | | |
| 103- | GRID | 104004 | 1 | 1. | 0.0 | 0.0 | 1 | 23456 | | |
| 104- | GRID | 105000 | 1 | 1. | 0.0 | 0.0 | 1 | 23456 | | |
| 105- | GRID | 105002 | 1 | 1. | 0.0 | 0.0 | 1 | 23456 | | |
| 106- | GRID | 105004 | 1 | 1. | 0.0 | 0.0 | 1 | 23456 | | |
| 107- | GRID | 106000 | 1 | 1. | 0.0 | 0.0 | 1 | 23456 | | |
| 108- | GRID | 106002 | 1 | 1. | 0.0 | 0.0 | 1 | 23456 | | |
| 109- | GRID | 106004 | 1 | 1. | 0.0 | 0.0 | 1 | 23456 | | |
| 110- | GRID | 107000 | 1 | 1. | 0.0 | 0.0 | 1 | 23456 | | |
| 111- | GRID | 107002 | 1 | 1. | 0.0 | 0.0 | 1 | 23456 | | |
| 112- | GRID | 107004 | 1 | 1. | 0.0 | 0.0 | 1 | 23456 | | |
| 113- | GRID | 108000 | 1 | 1. | 0.0 | 0.0 | 1 | 23456 | | |
| 114- | GRID | 108002 | 1 | 1. | 0.0 | 0.0 | 1 | 23456 | | |
| 115- | GRID | 108004 | 1 | 1. | 0.0 | 0.0 | 1 | 23456 | | |
| 116- | GRID | 109000 | 1 | 1. | 0.0 | 0.0 | 1 | 23456 | | |
| 117- | GRID | 109002 | 1 | 1. | 0.0 | 0.0 | 1 | 23456 | | |
| 118- | GRID | 109004 | 1 | 1. | 0.0 | 0.0 | 1 | 23456 | | |
| 119- | GRID | 110000 | 1 | 1. | 0.0 | 0.0 | 1 | 23456 | | |
| 120- | GRID | 110002 | 1 | 1. | 0.0 | 0.0 | 1 | 23456 | | |
| 121- | GRID | 110004 | 1 | 1. | 0.0 | 0.0 | 1 | 23456 | | |
| 122- | GRID | 111000 | 1 | 1. | 0.0 | 0.0 | 1 | 23456 | | |
| 123- | GRID | 111002 | 1 | 1. | 0.0 | 0.0 | 1 | 23456 | | |
| 124- | GRID | 111004 | 1 | 1. | 0.0 | 0.0 | 1 | 23456 | | |
| 125- | GRID | 601 | | | 0.0 | | 1 | 12456 | 1 | |
| 126- | GRID | 602 | | | 9. | | 1 | 12456 | 1 | |
| 127- | GRID | 603 | | | 18. | | 1 | 12456 | 1 | |
| 128- | GRID | 604 | | | 27. | | 1 | 12456 | 1 | |
| 129- | GRID | 605 | | | 36. | | 1 | 12456 | 1 | |
| 130- | GRID | 606 | | | 45. | | 1 | 12456 | 1 | |
| 131- | GRID | 607 | | | 54. | | 1 | 12456 | 1 | |
| 132- | GRID | 608 | | | 63. | | 1 | 12456 | 1 | |
| 133- | GRID | 609 | | | 72. | | 1 | 12456 | 1 | |
| 134- | GRID | 610 | | | 81. | | 1 | 12456 | 1 | |
| 135- | GRID | 611 | | | 90. | | 1 | 12456 | 1 | |
| 136- | GRID | 701 | | | 0.0 | | 1 | 12456 | 2 | |
| 137- | GRID | 702 | | | 9. | | 1 | 12456 | 2 | |
| 138- | GRID | 703 | | | 18. | | 1 | 12456 | 2 | |
| 139- | GRID | 704 | | | 27. | | 1 | 12456 | 2 | |
| 140- | GRID | 705 | | | 36. | | 1 | 12456 | 2 | |
| 141- | GRID | 706 | | | 45. | | 1 | 12456 | 2 | |
| 142- | GRID | 707 | | | 54. | | 1 | 12456 | 2 | |
| 143- | GRID | 708 | | | 63. | | 1 | 12456 | 2 | |
| 144- | GRID | 709 | | | 72. | | 1 | 12456 | 2 | |
| 145- | GRID | 710 | | | 81. | | 1 | 12456 | 2 | |
| 146- | GRID | 711 | | | 90. | | 1 | 12456 | 2 | |
| 147- | GRID | 801 | | | 0.0 | | 1 | 12456 | 3 | |
| 148- | GRID | 802 | | | 9. | | 1 | 12456 | 3 | |
| 149- | GRID | 803 | | | 18. | | 1 | 12456 | 3 | |
| 150- | GRID | 804 | | | 27. | | 1 | 12456 | 3 | |

CYLINDRICAL FLUID

APRIL 9, 1976 NASIKAN 27 1713
SORTED BULK DATA ECHO

| CARD
COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------------|------------|---|---|-----|---|---|---|-------|----|----|
| 151- | GRIDB 805 | | | 36. | | | 1 | 12456 | 3 | |
| 152- | GRIDB 806 | | | 45. | | | 1 | 12456 | 3 | |
| 153- | GRIDB 807 | | | 54. | | | 1 | 12456 | 3 | |
| 154- | GRIDB 808 | | | 63. | | | 1 | 12456 | 3 | |
| 155- | GRIDB 809 | | | 72. | | | 1 | 12456 | 3 | |
| 156- | GRIDB 810 | | | 81. | | | 1 | 12456 | 3 | |
| 157- | GRIDB 811 | | | 90. | | | 1 | 12456 | 3 | |
| 158- | GRIDB 901 | | | 0.0 | | | 1 | 12456 | 4 | |
| 159- | GRIDB 902 | | | 9. | | | 1 | 12456 | 4 | |
| 160- | GRIDB 903 | | | 18. | | | 1 | 12456 | 4 | |
| 161- | GRIDB 904 | | | 27. | | | 1 | 12456 | 4 | |
| 162- | GRIDB 905 | | | 36. | | | 1 | 12456 | 4 | |
| 163- | GRIDB 906 | | | 45. | | | 1 | 12456 | 4 | |
| 164- | GRIDB 907 | | | 54. | | | 1 | 12456 | 4 | |
| 165- | GRIDB 908 | | | 63. | | | 1 | 12456 | 4 | |
| 166- | GRIDB 909 | | | 72. | | | 1 | 12456 | 4 | |
| 167- | GRIDB 910 | | | 81. | | | 1 | 12456 | 4 | |
| 168- | GRIDB 911 | | | 90. | | | 1 | 12456 | 4 | |
| 169- | GRIDB 1001 | | | 0.0 | | | 1 | 12456 | 5 | |
| 170- | GRIDB 1002 | | | 9. | | | 1 | 12456 | 5 | |
| 171- | GRIDB 1003 | | | 18. | | | 1 | 12456 | 5 | |
| 172- | GRIDB 1004 | | | 27. | | | 1 | 12456 | 5 | |
| 173- | GRIDB 1005 | | | 36. | | | 1 | 12456 | 5 | |
| 174- | GRIDB 1006 | | | 45. | | | 1 | 12456 | 5 | |
| 175- | GRIDB 1007 | | | 54. | | | 1 | 12456 | 5 | |
| 176- | GRIDB 1008 | | | 63. | | | 1 | 12456 | 5 | |
| 177- | GRIDB 1009 | | | 72. | | | 1 | 12456 | 5 | |
| 178- | GRIDB 1010 | | | 81. | | | 1 | 12456 | 5 | |
| 179- | GRIDB 1011 | | | 90. | | | 1 | 12456 | 5 | |
| 180- | GRIDB 2001 | | | 0.0 | | | 1 | 23456 | 10 | |
| 181- | GRIDB 2002 | | | 9. | | | 1 | 23456 | 10 | |
| 182- | GRIDB 2003 | | | 18. | | | 1 | 23456 | 10 | |
| 183- | GRIDB 2004 | | | 27. | | | 1 | 23456 | 10 | |
| 184- | GRIDB 2005 | | | 36. | | | 1 | 23456 | 10 | |
| 185- | GRIDB 2006 | | | 45. | | | 1 | 23456 | 10 | |
| 186- | GRIDB 2007 | | | 54. | | | 1 | 23456 | 10 | |
| 187- | GRIDB 2008 | | | 63. | | | 1 | 23456 | 10 | |
| 188- | GRIDB 2009 | | | 72. | | | 1 | 23456 | 10 | |
| 189- | GRIDB 2010 | | | 81. | | | 1 | 23456 | 10 | |
| 190- | GRIDB 2011 | | | 90. | | | 1 | 23456 | 10 | |
| 191- | GRIDB 3001 | | | 0.0 | | | 1 | 23456 | 15 | |
| 192- | GRIDB 3002 | | | 9. | | | 1 | 23456 | 15 | |
| 193- | GRIDB 3003 | | | 18. | | | 1 | 23456 | 15 | |
| 194- | GRIDB 3004 | | | 27. | | | 1 | 23456 | 15 | |
| 195- | GRIDB 3005 | | | 36. | | | 1 | 23456 | 15 | |
| 196- | GRIDB 3006 | | | 45. | | | 1 | 23456 | 15 | |
| 197- | GRIDB 3007 | | | 54. | | | 1 | 23456 | 15 | |
| 198- | GRIDB 3008 | | | 63. | | | 1 | 23456 | 15 | |
| 199- | GRIDB 3009 | | | 72. | | | 1 | 23456 | 15 | |
| 200- | GRIDB 3010 | | | 81. | | | 1 | 23456 | 15 | |

ORIGINAL PAGE IS
OF POOR QUALITY

SORTED BULK DATA ECHD

| CARD
COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-----------------|---|---|---|---|-----|---|---|-------|----|----|
| 201- GRID8 3011 | | | | | 90. | 1 | | 23456 | 15 | |
| 202- GRID8 4001 | | | | | 0.0 | 1 | | 23456 | 20 | |
| 203- GRID8 4002 | | | | | 9. | 1 | | 23456 | 20 | |
| 204- GRID8 4003 | | | | | 18. | 1 | | 23456 | 20 | |
| 205- GRID8 4004 | | | | | 27. | 1 | | 23456 | 20 | |
| 206- GRID8 4005 | | | | | 36. | 1 | | 23456 | 20 | |
| 207- GRID8 4006 | | | | | 45. | 1 | | 23456 | 20 | |
| 208- GRID8 4007 | | | | | 54. | 1 | | 23456 | 20 | |
| 209- GRID8 4008 | | | | | 63. | 1 | | 23456 | 20 | |
| 210- GRID8 4009 | | | | | 72. | 1 | | 23456 | 20 | |
| 211- GRID8 4010 | | | | | 81. | 1 | | 23456 | 20 | |
| 212- GRID8 4011 | | | | | 90. | 1 | | 23456 | 20 | |
| 213- GRID8 5001 | | | | | 0.0 | 1 | | 23456 | 25 | |
| 214- GRID8 5002 | | | | | 9. | 1 | | 23456 | 25 | |
| 215- GRID8 5003 | | | | | 18. | 1 | | 23456 | 25 | |
| 216- GRID8 5004 | | | | | 27. | 1 | | 23456 | 25 | |
| 217- GRID8 5005 | | | | | 36. | 1 | | 23456 | 25 | |
| 218- GRID8 5006 | | | | | 45. | 1 | | 23456 | 25 | |
| 219- GRID8 5007 | | | | | 54. | 1 | | 23456 | 25 | |
| 220- GRID8 5008 | | | | | 63. | 1 | | 23456 | 25 | |
| 221- GRID8 5009 | | | | | 72. | 1 | | 23456 | 25 | |
| 222- GRID8 5010 | | | | | 81. | 1 | | 23456 | 25 | |
| 223- GRID8 5011 | | | | | 90. | 1 | | 23456 | 25 | |
| 224- GRID8 6001 | | | | | 0.0 | 1 | | 23456 | 30 | |
| 225- GRID8 6002 | | | | | 9. | 1 | | 23456 | 30 | |
| 226- GRID8 6003 | | | | | 18. | 1 | | 23456 | 30 | |
| 227- GRID8 6004 | | | | | 27. | 1 | | 23456 | 30 | |
| 228- GRID8 6005 | | | | | 36. | 1 | | 23456 | 30 | |
| 229- GRID8 6006 | | | | | 45. | 1 | | 23456 | 30 | |
| 230- GRID8 6007 | | | | | 54. | 1 | | 23456 | 30 | |
| 231- GRID8 6008 | | | | | 63. | 1 | | 23456 | 30 | |
| 232- GRID8 6009 | | | | | 72. | 1 | | 23456 | 30 | |
| 233- GRID8 6010 | | | | | 81. | 1 | | 23456 | 30 | |
| 234- GRID8 6011 | | | | | 90. | 1 | | 23456 | 30 | |
| 235- GRID8 7001 | | | | | 0.0 | 1 | | 23456 | 35 | |
| 236- GRID8 7002 | | | | | 9. | 1 | | 23456 | 3 | |
| 237- GRID8 7003 | | | | | 18. | 1 | | 23456 | 31 | |
| 238- GRID8 7004 | | | | | 27. | 1 | | 23456 | 34 | |
| 239- GRID8 7005 | | | | | 36. | 1 | | 23456 | 34 | |
| 240- GRID8 7006 | | | | | 45. | 1 | | 23456 | 34 | |
| 241- GRID8 7007 | | | | | 54. | 1 | | 23456 | 34 | |
| 242- GRID8 7008 | | | | | 63. | 1 | | 23456 | 34 | |
| 243- GRID8 7009 | | | | | 72. | 1 | | 23456 | 34 | |
| 244- GRID8 7010 | | | | | 81. | 1 | | 23456 | 35 | |
| 245- GRID8 7011 | | | | | 90. | 1 | | 23456 | 35 | |
| 246- GRID8 8001 | | | | | 0.0 | 1 | | 23456 | 40 | |
| 247- GRID8 8002 | | | | | 9. | 1 | | 23456 | 40 | |
| 248- GRID8 8003 | | | | | 18. | 1 | | 23456 | 40 | |
| 249- GRID8 8004 | | | | | 27. | 1 | | 23456 | 40 | |
| 250- GRID8 8005 | | | | | 36. | 1 | | 23456 | 40 | |

CYLINDRICAL FLUID

APRIL 9. 1974 NASTRAN 2/ 1/73

SORTED BULK DATA ECHO

| CARD
COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------------|---------|-------|--------|-----|--------|--------|-------|--------|---------|----|
| 251- | GRIDB | 8006 | | 45. | | 1 | 23456 | 40 | | |
| 252- | GRIDB | 8007 | | 54. | | 1 | 23456 | 40 | | |
| 253- | GRIDB | 8008 | | 63. | | 1 | 23456 | 40 | | |
| 254- | GRIDB | 8009 | | 72. | | 1 | 23456 | 40 | | |
| 255- | GRIDB | 8010 | | 81. | | 1 | 23456 | 40 | | |
| 256- | GRIDB | 8011 | | 90. | | 1 | 23456 | 40 | | |
| 257- | GRIDB | 9001 | | 0.0 | | 1 | 23456 | 45 | | |
| 258- | GRIDB | 9002 | | 9. | | 1 | 23456 | 45 | | |
| 259- | GRIDB | 9003 | | 18. | | 1 | 23456 | 45 | | |
| 260- | GRIDB | 9004 | | 27. | | 1 | 23456 | 45 | | |
| 261- | GRIDB | 9005 | | 36. | | 1 | 23456 | 45 | | |
| 262- | GRIDB | 9006 | | 45. | | 1 | 23456 | 45 | | |
| 263- | GRIDB | 9007 | | 54. | | 1 | 23456 | 45 | | |
| 264- | GRIDB | 9008 | | 63. | | 1 | 23456 | 45 | | |
| 265- | GRIDB | 9009 | | 72. | | 1 | 23456 | 45 | | |
| 266- | GRIDB | 9010 | | 81. | | 1 | 23456 | 45 | | |
| 267- | GRIDB | 9011 | | 90. | | 1 | 23456 | 45 | | |
| 268- | GRIDB | 10001 | | 0.0 | | 1 | 23456 | 50 | | |
| 269- | GRIDB | 10002 | | 9. | | 1 | 23456 | 50 | | |
| 270- | GRIDB | 10003 | | 18. | | 1 | 23456 | 50 | | |
| 271- | GRIDB | 10004 | | 27. | | 1 | 23456 | 50 | | |
| 272- | GRIDB | 10005 | | 36. | | 1 | 23456 | 50 | | |
| 273- | GRIDB | 10006 | | 45. | | 1 | 23456 | 50 | | |
| 274- | GRIDB | 10007 | | 54. | | 1 | 23456 | 50 | | |
| 275- | GRIDB | 10008 | | 63. | | 1 | 23456 | 50 | | |
| 276- | GRIDB | 10009 | | 72. | | 1 | 23456 | 50 | | |
| 277- | GRIDB | 10010 | | 81. | | 1 | 23456 | 50 | | |
| 278- | GRIDB | 10011 | | 90. | | 1 | 23456 | 50 | | |
| 279- | GRIDB | 11001 | | 0.0 | | 1 | 23456 | 55 | | |
| 280- | GRIDB | 11002 | | 9. | | 1 | 23456 | 55 | | |
| 281- | GRIDB | 11003 | | 18. | | 1 | 23456 | 55 | | |
| 282- | GRIDB | 11004 | | 27. | | 1 | 23456 | 55 | | |
| 283- | GRIDB | 11005 | | 36. | | 1 | 23456 | 55 | | |
| 284- | GRIDB | 11006 | | 45. | | 1 | 23456 | 55 | | |
| 285- | GRIDB | 11007 | | 54. | | 1 | 23456 | 55 | | |
| 286- | GRIDB | 11008 | | 63. | | 1 | 23456 | 55 | | |
| 287- | GRIDB | 11009 | | 72. | | 1 | 23456 | 55 | | |
| 288- | GRIDB | 11010 | | 81. | | 1 | 23456 | 55 | | |
| 289- | GRIDB | 11011 | | 90. | | 1 | 23456 | 55 | | |
| 290- | MPC | 1 | 601 | -1. | 100600 | 3 | 1. | | 2M00601 | |
| 291- | EM00601 | | 100602 | 3 | 1. | 100604 | 3 | 1. | | |
| 292- | MPC | 1 | 602 | -1. | 100600 | 3 | 1. | | 2M00602 | |
| 293- | EM00602 | | 100602 | 3 | .9511 | 100604 | 3 | .8090 | | |
| 294- | MPC | 1 | 603 | -1. | 100600 | 3 | 1. | | 2M00603 | |
| 295- | EM00603 | | 100602 | 3 | .8090 | 100604 | 3 | .3090 | | |
| 296- | MPC | 1 | 604 | -1. | 100600 | 3 | 1. | | 2M00604 | |
| 297- | EM00604 | | 100602 | 3 | .5878 | 100604 | 3 | -.3090 | | |
| 298- | MPC | 1 | 605 | -1. | 100600 | 3 | 1. | | 2M00605 | |
| 299- | EM00605 | | 100602 | 3 | .3090 | 100604 | 3 | -.8090 | | |
| 300- | MPC | 1 | 606 | -1. | 100600 | 3 | 1. | | 2M00606 | |

| CARD
COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------------|---------|--------|---|-------|--------|---|-------|---|---|---------|
| 301- | EM00606 | 100602 | 3 | 0. | 100604 | 3 | -1. | | | EM00607 |
| 302- | MPC | 607 | 3 | -1. | 100600 | 3 | 1. | | | |
| 303- | EM00607 | 100602 | 3 | -3090 | 100604 | 3 | -8090 | | | EM00608 |
| 304- | MPC | 608 | 3 | -1. | 100600 | 3 | 1. | | | |
| 305- | EM00608 | 100602 | 3 | -5878 | 100604 | 3 | -3090 | | | EM00609 |
| 306- | MPC | 609 | 3 | -1. | 100600 | 3 | 1. | | | |
| 307- | EM00609 | 100602 | 3 | -8090 | 100604 | 3 | -3090 | | | EM00610 |
| 308- | MPC | 610 | 3 | -1. | 100600 | 3 | 1. | | | |
| 309- | EM00610 | 100602 | 3 | -9511 | 100604 | 3 | -8090 | | | EM00611 |
| 310- | MPC | 611 | 3 | -1. | 100600 | 3 | 1. | | | |
| 311- | EM00611 | 100602 | 3 | -1. | 100604 | 3 | 1. | | | EM00701 |
| 312- | MPC | 701 | 3 | -1. | 100700 | 3 | 1. | | | |
| 313- | EM00701 | 100702 | 3 | 1. | 100704 | 3 | 1. | | | EM00702 |
| 314- | MPC | 702 | 3 | -1. | 100700 | 3 | 1. | | | |
| 315- | EM00702 | 100702 | 3 | .9511 | 100704 | 3 | .8090 | | | EM00703 |
| 316- | MPC | 703 | 3 | -1. | 100700 | 3 | 1. | | | |
| 317- | EM00703 | 100702 | 3 | .8090 | 100704 | 3 | .3090 | | | EM00704 |
| 318- | MPC | 704 | 3 | -1. | 100700 | 3 | 1. | | | |
| 319- | EM00704 | 100702 | 3 | .5878 | 100704 | 3 | -3090 | | | EM00705 |
| 320- | MPC | 705 | 3 | -1. | 100700 | 3 | 1. | | | |
| 321- | EM00705 | 100702 | 3 | .3090 | 100704 | 3 | -8090 | | | EM00706 |
| 322- | MPC | 706 | 3 | -1. | 100700 | 3 | 1. | | | |
| 323- | EM00706 | 100702 | 3 | 0. | 100704 | 3 | -1. | | | EM00707 |
| 324- | MPC | 707 | 3 | -1. | 100700 | 3 | 1. | | | |
| 325- | EM00707 | 100702 | 3 | -3090 | 100704 | 3 | -8090 | | | EM00708 |
| 326- | MPC | 708 | 3 | -1. | 100700 | 3 | 1. | | | |
| 327- | EM00708 | 100702 | 3 | -5878 | 100704 | 3 | -3090 | | | EM00709 |
| 328- | MPC | 709 | 3 | -1. | 100700 | 3 | 1. | | | |
| 329- | EM00709 | 100702 | 3 | -8090 | 100704 | 3 | .3090 | | | EM00710 |
| 330- | MPC | 710 | 3 | -1. | 100700 | 3 | 1. | | | |
| 331- | EM00710 | 100702 | 3 | -9511 | 100704 | 3 | .8090 | | | EM00711 |
| 332- | MPC | 711 | 3 | -1. | 100700 | 3 | 1. | | | |
| 333- | EM00711 | 100702 | 3 | -1. | 100704 | 3 | 1. | | | EM00801 |
| 334- | MPC | 801 | 3 | -1. | 100800 | 3 | 1. | | | |
| 335- | EM00801 | 100802 | 3 | 1. | 100804 | 3 | 1. | | | EM00802 |
| 336- | MPC | 802 | 3 | -1. | 100800 | 3 | 1. | | | |
| 337- | EM00802 | 100802 | 3 | .9511 | 100804 | 3 | .8090 | | | EM00803 |
| 338- | MPC | 803 | 3 | -1. | 100800 | 3 | 1. | | | |
| 339- | EM00803 | 100802 | 3 | -8090 | 100804 | 3 | .3090 | | | EM00804 |
| 340- | MPC | 804 | 3 | -1. | 100800 | 3 | 1. | | | |
| 341- | EM00804 | 100802 | 3 | .5878 | 100804 | 3 | -3090 | | | EM00805 |
| 342- | MPC | 805 | 3 | -1. | 100800 | 3 | 1. | | | |
| 343- | EM00805 | 100802 | 3 | .3090 | 100804 | 3 | -8090 | | | EM00806 |
| 344- | MPC | 806 | 3 | -1. | 100800 | 3 | 1. | | | |
| 345- | EM00806 | 100802 | 3 | 0. | 100804 | 3 | -1. | | | EM00807 |
| 346- | MPC | 807 | 3 | -1. | 100800 | 3 | 1. | | | |
| 347- | EM00807 | 100802 | 3 | -3090 | 100804 | 3 | -8090 | | | EM00808 |
| 348- | MPC | 808 | 3 | -1. | 100800 | 3 | 1. | | | |
| 349- | EM00808 | 100802 | 3 | .5878 | 100804 | 3 | -3090 | | | EM00809 |
| 350- | MPC | 809 | 3 | -1. | 100800 | 3 | 1. | | | |

APRIL 9, 1974 NASIKAN 27 1713

SORTED BULK DATA ECHO

| CARD
COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------------|---------|--------|---|---|-------|--------|---|---|-------|---------|
| 351- | CM00809 | 100802 | 3 | - | -8090 | 100804 | 3 | - | -3090 | CM00810 |
| 352- | MPC | 810 | 3 | - | -1. | 100800 | 3 | - | 1. | CM00810 |
| 353- | CM00810 | 100802 | 3 | - | -9511 | 100804 | 3 | - | -8090 | CM00811 |
| 354- | MPC | 811 | 3 | - | -1. | 100800 | 3 | - | 1. | CM00811 |
| 355- | CM00811 | 100802 | 3 | - | -1. | 100804 | 3 | - | 1. | CM00901 |
| 356- | MPC | 901 | 3 | - | -1. | 100900 | 3 | - | 1. | CM00901 |
| 357- | CM00901 | 100902 | 3 | - | 1. | 100904 | 3 | - | 1. | CM00902 |
| 358- | MPC | 902 | 3 | - | -1. | 100900 | 3 | - | 1. | CM00902 |
| 359- | CM00902 | 100902 | 3 | - | -9511 | 100904 | 3 | - | -8090 | CM00903 |
| 360- | MPC | 903 | 3 | - | -1. | 100900 | 3 | - | 1. | CM00903 |
| 361- | CM00903 | 100902 | 3 | - | -8090 | 100904 | 3 | - | -3090 | CM00904 |
| 362- | MPC | 904 | 3 | - | -1. | 100900 | 3 | - | 1. | CM00904 |
| 363- | CM00904 | 100902 | 3 | - | -5878 | 100904 | 3 | - | -3090 | CM00905 |
| 364- | MPC | 905 | 3 | - | -1. | 100900 | 3 | - | 1. | CM00905 |
| 365- | CM00905 | 100902 | 3 | - | -3090 | 100904 | 3 | - | -8090 | CM00906 |
| 366- | MPC | 906 | 3 | - | -1. | 100900 | 3 | - | 1. | CM00906 |
| 367- | CM00906 | 100902 | 3 | - | 0. | 100904 | 3 | - | -1. | CM00907 |
| 368- | MPC | 907 | 3 | - | -1. | 100900 | 3 | - | 1. | CM00907 |
| 369- | CM00907 | 100902 | 3 | - | -3090 | 100904 | 3 | - | -8090 | CM00908 |
| 370- | MPC | 908 | 3 | - | -1. | 100900 | 3 | - | 1. | CM00908 |
| 371- | CM00908 | 100902 | 3 | - | -5878 | 100904 | 3 | - | -3090 | CM00909 |
| 372- | MPC | 909 | 3 | - | -1. | 100900 | 3 | - | 1. | CM00909 |
| 373- | CM00909 | 100902 | 3 | - | -8090 | 100904 | 3 | - | -3090 | CM00910 |
| 374- | MPC | 910 | 3 | - | -1. | 100900 | 3 | - | 1. | CM00910 |
| 375- | CM00910 | 100902 | 3 | - | -9511 | 100904 | 3 | - | -8090 | CM00911 |
| 376- | MPC | 911 | 3 | - | -1. | 100900 | 3 | - | 1. | CM00911 |
| 377- | CM00911 | 100902 | 3 | - | -1. | 100904 | 3 | - | 1. | CM01001 |
| 378- | MPC | 1001 | 3 | - | -1. | 101000 | 3 | - | 1. | CM01001 |
| 379- | CM01001 | 101002 | 3 | - | 1. | 101004 | 3 | - | 1. | CM01002 |
| 380- | MPC | 1002 | 3 | - | -1. | 101000 | 3 | - | 1. | CM01002 |
| 381- | CM01002 | 101002 | 3 | - | -9511 | 101004 | 3 | - | -8090 | CM01003 |
| 382- | MPC | 1003 | 3 | - | -1. | 101000 | 3 | - | 1. | CM01003 |
| 383- | CM01003 | 101002 | 3 | - | -8090 | 101004 | 3 | - | -3090 | CM01004 |
| 384- | MPC | 1004 | 3 | - | -1. | 101000 | 3 | - | 1. | CM01004 |
| 385- | CM01004 | 101002 | 3 | - | -5878 | 101004 | 3 | - | -3090 | CM01005 |
| 386- | MPC | 1005 | 3 | - | -1. | 101000 | 3 | - | 1. | CM01005 |
| 387- | CM01005 | 101002 | 3 | - | -3090 | 101004 | 3 | - | -8090 | CM01006 |
| 388- | MPC | 1006 | 3 | - | -1. | 101000 | 3 | - | 1. | CM01006 |
| 389- | CM01006 | 101002 | 3 | - | 0. | 101004 | 3 | - | -1. | CM01007 |
| 390- | MPC | 1007 | 3 | - | -1. | 101000 | 3 | - | 1. | CM01007 |
| 391- | CM01007 | 101002 | 3 | - | -3090 | 101004 | 3 | - | -8090 | CM01008 |
| 392- | MPC | 1008 | 3 | - | -1. | 101000 | 3 | - | 1. | CM01008 |
| 393- | CM01008 | 101002 | 3 | - | -5878 | 101004 | 3 | - | -3090 | CM01009 |
| 394- | MPC | 1009 | 3 | - | -1. | 101000 | 3 | - | 1. | CM01009 |
| 395- | CM01009 | 101002 | 3 | - | -8090 | 101004 | 3 | - | -3090 | CM01010 |
| 396- | MPC | 1010 | 3 | - | -1. | 101000 | 3 | - | 1. | CM01010 |
| 397- | CM01010 | 101002 | 3 | - | -9511 | 101004 | 3 | - | -8090 | CM01011 |
| 398- | MPC | 1011 | 3 | - | -1. | 101000 | 3 | - | 1. | CM01011 |
| 399- | CM01011 | 101002 | 3 | - | -1. | 101004 | 3 | - | 1. | CM02001 |
| 400- | MPC | 2001 | 1 | - | -1. | 102000 | 1 | - | 1. | CM02001 |

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SORTED BULK DATA ECHO

| CARD
COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------------|---------|--------|---|-------|--------|---|-------|---|---|---------|
| 401- | CM02001 | 102002 | 1 | 1. | 102004 | 1 | 1. | | | CM02002 |
| 402- | MPC | 2002 | 1 | -1. | 102000 | 1 | 1. | | | |
| 403- | CM02002 | 102002 | 1 | .9511 | 102004 | 1 | -8090 | | | CM02003 |
| 404- | MPC | 2003 | 1 | -1. | 102000 | 1 | 1. | | | |
| 405- | CM02003 | 102002 | 1 | .8090 | 102004 | 1 | .3090 | | | CM02004 |
| 406- | MPC | 2004 | 1 | -1. | 102000 | 1 | 1. | | | |
| 407- | CM02004 | 102002 | 1 | .5878 | 102004 | 1 | -3090 | | | CM02005 |
| 408- | MPC | 2005 | 1 | -1. | 102000 | 1 | 1. | | | |
| 409- | CM02005 | 102002 | 1 | .3090 | 102004 | 1 | -8090 | | | CM02006 |
| 410- | MPC | 2006 | 1 | -1. | 102000 | 1 | 1. | | | |
| 411- | CM02006 | 102002 | 1 | 0. | 102004 | 1 | -1. | | | CM02007 |
| 412- | MPC | 2007 | 1 | -1. | 102000 | 1 | 1. | | | |
| 413- | CM02007 | 102002 | 1 | -3090 | 102004 | 1 | -8090 | | | CM02008 |
| 414- | MPC | 2008 | 1 | -1. | 102000 | 1 | 1. | | | |
| 415- | CM02008 | 102002 | 1 | -5878 | 102004 | 1 | -3090 | | | CM02009 |
| 416- | MPC | 2009 | 1 | -1. | 102000 | 1 | 1. | | | |
| 417- | CM02009 | 102002 | 1 | .8090 | 102004 | 1 | .3090 | | | CM02010 |
| 418- | MPC | 2010 | 1 | -1. | 102000 | 1 | 1. | | | |
| 419- | CM02010 | 102002 | 1 | -9511 | 102004 | 1 | -8090 | | | CM02011 |
| 420- | MPC | 2011 | 1 | -1. | 102000 | 1 | 1. | | | |
| 421- | CM02011 | 102002 | 1 | -1. | 102004 | 1 | 1. | | | CM03001 |
| 422- | MPC | 3001 | 1 | -1. | 103000 | 1 | 1. | | | |
| 423- | CM03001 | 103002 | 1 | 1. | 103004 | 1 | 1. | | | CM03002 |
| 424- | MPC | 3002 | 1 | -1. | 103000 | 1 | 1. | | | |
| 425- | CM03002 | 103002 | 1 | .9511 | 103004 | 1 | -8090 | | | CM03003 |
| 426- | MPC | 3003 | 1 | -1. | 103000 | 1 | 1. | | | |
| 427- | CM03003 | 103002 | 1 | .8090 | 103004 | 1 | .3090 | | | CM03004 |
| 428- | MPC | 3004 | 1 | -1. | 103000 | 1 | 1. | | | |
| 429- | CM03004 | 103002 | 1 | .5878 | 103004 | 1 | -3090 | | | CM03005 |
| 430- | MPC | 3005 | 1 | -1. | 103000 | 1 | 1. | | | |
| 431- | CM03005 | 103002 | 1 | .3090 | 103004 | 1 | -8090 | | | CM03006 |
| 432- | MPC | 3006 | 1 | -1. | 103000 | 1 | 1. | | | |
| 433- | CM03006 | 103002 | 1 | 0. | 103004 | 1 | -1. | | | CM03007 |
| 434- | MPC | 3007 | 1 | -1. | 103000 | 1 | 1. | | | |
| 435- | CM03007 | 103002 | 1 | -3090 | 103004 | 1 | -8090 | | | CM03008 |
| 436- | MPC | 3008 | 1 | -1. | 103000 | 1 | 1. | | | |
| 437- | CM03008 | 103002 | 1 | -5878 | 103004 | 1 | -3090 | | | CM03009 |
| 438- | MPC | 3009 | 1 | -1. | 103000 | 1 | 1. | | | |
| 439- | CM03009 | 103002 | 1 | -8090 | 103004 | 1 | .3090 | | | CM03010 |
| 440- | MPC | 3010 | 1 | -1. | 103000 | 1 | 1. | | | |
| 441- | CM03010 | 103002 | 1 | -9511 | 103004 | 1 | -8090 | | | CM03011 |
| 442- | MPC | 3011 | 1 | -1. | 103000 | 1 | 1. | | | |
| 443- | CM03011 | 103002 | 1 | -1. | 103004 | 1 | 1. | | | CM04001 |
| 444- | MPC | 4001 | 1 | -1. | 104000 | 1 | 1. | | | |
| 445- | CM04001 | 104002 | 1 | 1. | 104004 | 1 | 1. | | | CM04002 |
| 446- | MPC | 4002 | 1 | -1. | 104000 | 1 | 1. | | | |
| 447- | CM04002 | 104002 | 1 | .9511 | 104004 | 1 | -8090 | | | CM04003 |
| 448- | MPC | 4003 | 1 | -1. | 104000 | 1 | 1. | | | |
| 449- | CM04003 | 104002 | 1 | .8090 | 104004 | 1 | -3090 | | | CM04004 |
| 450- | MPC | 4004 | 1 | -1. | 104000 | 1 | 1. | | | |

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| CARD
COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------------|---------|--------|---|------|--------|---|---|------|---|---------|
| 451- | CM04004 | 104002 | 1 | 5078 | 104004 | 1 | 1 | 3090 | | CM04005 |
| 452- | MPC | 4005 | 1 | -1. | 104000 | 1 | 1 | 8090 | | |
| 453- | CM04005 | 104002 | 1 | 3090 | 104004 | 1 | 1 | | | CM04006 |
| 454- | MPC | 4006 | 1 | -1. | 104000 | 1 | 1 | 1. | | |
| 455- | CM04006 | 104002 | 1 | 0. | 104004 | 1 | 1 | -1. | | CM04007 |
| 456- | MPC | 4007 | 1 | -1. | 104000 | 1 | 1 | 1. | | |
| 457- | CM04007 | 104002 | 1 | 3090 | 104004 | 1 | 1 | 8090 | | CM04008 |
| 458- | MPC | 4008 | 1 | -1. | 104000 | 1 | 1 | 1. | | |
| 459- | CM04008 | 104002 | 1 | 5078 | 104004 | 1 | 1 | 3090 | | CM04009 |
| 460- | MPC | 4009 | 1 | -1. | 104000 | 1 | 1 | 1. | | |
| 461- | CM04009 | 104002 | 1 | 8090 | 104004 | 1 | 1 | 3090 | | CM04010 |
| 462- | MPC | 4010 | 1 | -1. | 104000 | 1 | 1 | 1. | | |
| 463- | CM04010 | 104002 | 1 | 9511 | 104004 | 1 | 1 | 8090 | | CM04011 |
| 464- | MPC | 4011 | 1 | -1. | 104000 | 1 | 1 | 1. | | |
| 465- | CM04011 | 104002 | 1 | -1. | 104004 | 1 | 1 | 1. | | CM05001 |
| 466- | MPC | 5001 | 1 | -1. | 105000 | 1 | 1 | 1. | | |
| 467- | CM05001 | 105002 | 1 | 1. | 105004 | 1 | 1 | 1. | | CM05002 |
| 468- | MPC | 5002 | 1 | -1. | 105000 | 1 | 1 | 6090 | | |
| 469- | CM05002 | 105002 | 1 | 9511 | 105004 | 1 | 1 | 1. | | CM05003 |
| 470- | MPC | 5003 | 1 | -1. | 105000 | 1 | 1 | 3090 | | |
| 471- | CM05003 | 105002 | 1 | 8090 | 105004 | 1 | 1 | 1. | | CM05004 |
| 472- | MPC | 5004 | 1 | -1. | 105000 | 1 | 1 | 1. | | |
| 473- | CM05004 | 105002 | 1 | 5878 | 105004 | 1 | 1 | 3090 | | CM05005 |
| 474- | MPC | 5005 | 1 | -1. | 105000 | 1 | 1 | 1. | | |
| 475- | CM05005 | 105002 | 1 | 3090 | 105004 | 1 | 1 | 8090 | | CM05006 |
| 476- | MPC | 5006 | 1 | -1. | 105000 | 1 | 1 | 1. | | |
| 477- | CM05006 | 105002 | 1 | 0. | 105004 | 1 | 1 | -1. | | CM05007 |
| 478- | MPC | 5007 | 1 | -1. | 105000 | 1 | 1 | 1. | | |
| 479- | CM05007 | 105002 | 1 | 3090 | 105004 | 1 | 1 | 8090 | | CM05008 |
| 480- | MPC | 5008 | 1 | -1. | 105000 | 1 | 1 | 1. | | |
| 481- | CM05008 | 105002 | 1 | 5878 | 105004 | 1 | 1 | 3090 | | CM05009 |
| 482- | MPC | 5009 | 1 | -1. | 105000 | 1 | 1 | 1. | | |
| 483- | CM05009 | 105002 | 1 | 8090 | 105004 | 1 | 1 | 3090 | | CM05010 |
| 484- | MPC | 5010 | 1 | -1. | 105000 | 1 | 1 | 1. | | |
| 485- | CM05010 | 105002 | 1 | 9511 | 105004 | 1 | 1 | 8090 | | CM05011 |
| 486- | MPC | 5011 | 1 | -1. | 105000 | 1 | 1 | 1. | | |
| 487- | CM05011 | 105002 | 1 | -1. | 105004 | 1 | 1 | 1. | | CM06001 |
| 488- | MPC | 6001 | 1 | -1. | 106000 | 1 | 1 | 1. | | |
| 489- | CM06001 | 106002 | 1 | 1. | 106004 | 1 | 1 | 1. | | CM06002 |
| 490- | MPC | 6002 | 1 | -1. | 106000 | 1 | 1 | 8090 | | |
| 491- | CM06002 | 106002 | 1 | 9511 | 106004 | 1 | 1 | 1. | | CM06003 |
| 492- | MPC | 6003 | 1 | -1. | 106000 | 1 | 1 | 3090 | | |
| 493- | CM06003 | 106002 | 1 | 8090 | 106004 | 1 | 1 | 1. | | CM06004 |
| 494- | MPC | 6004 | 1 | -1. | 106000 | 1 | 1 | 3090 | | |
| 495- | CM06004 | 106002 | 1 | 5878 | 106004 | 1 | 1 | 1. | | CM06005 |
| 496- | MPC | 6005 | 1 | -1. | 106000 | 1 | 1 | 1. | | |
| 497- | CM06005 | 106002 | 1 | 3090 | 106004 | 1 | 1 | 8090 | | CM06006 |
| 498- | MPC | 6006 | 1 | -1. | 106000 | 1 | 1 | 1. | | |
| 499- | CM06006 | 106002 | 1 | 0. | 106004 | 1 | 1 | -1. | | CM06007 |
| 500- | MPC | 6007 | 1 | -1. | 106000 | 1 | 1 | 1. | | |

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| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------------|---------|---|--------|---|--------|--------|---|--------|---|---------|
| 501-
COUNT | CM06007 | 1 | 106002 | 1 | -.3090 | 106004 | 1 | -.8090 | | CM06008 |
| 502- | MPC | 1 | 6008 | 1 | -1. | 106000 | 1 | 1. | | |
| 503- | CM06008 | 1 | 106002 | 1 | -.5878 | 106004 | 1 | -.3090 | | CM06009 |
| 504- | MPC | 1 | 6009 | 1 | -1. | 106000 | 1 | 1. | | |
| 505- | CM06009 | 1 | 106002 | 1 | -.8090 | 106004 | 1 | -.3090 | | CM06010 |
| 506- | MPC | 1 | 6010 | 1 | -1. | 106000 | 1 | 1. | | |
| 507- | CM06010 | 1 | 106002 | 1 | -.9511 | 106004 | 1 | -.8090 | | CM06011 |
| 508- | MPC | 1 | 6011 | 1 | -1. | 106000 | 1 | 1. | | |
| 509- | CM06011 | 1 | 106002 | 1 | -1. | 106004 | 1 | 1. | | CM07001 |
| 510- | MPC | 1 | 7001 | 1 | -1. | 107000 | 1 | 1. | | |
| 511- | CM07001 | 1 | 107002 | 1 | 1. | 107004 | 1 | 1. | | CM07002 |
| 512- | MPC | 1 | 7002 | 1 | -1. | 107000 | 1 | 1. | | |
| 513- | CM07002 | 1 | 107002 | 1 | .9511 | 107004 | 1 | -.8090 | | CM07003 |
| 514- | MPC | 1 | 7003 | 1 | -1. | 107000 | 1 | 1. | | |
| 515- | CM07003 | 1 | 107002 | 1 | -.8090 | 107004 | 1 | -.3090 | | CM07004 |
| 516- | MPC | 1 | 7004 | 1 | -1. | 107000 | 1 | 1. | | |
| 517- | CM07004 | 1 | 107002 | 1 | -.5878 | 107004 | 1 | -.3090 | | CM07005 |
| 518- | MPC | 1 | 7005 | 1 | -1. | 107000 | 1 | 1. | | |
| 519- | CM07005 | 1 | 107002 | 1 | .3090 | 107004 | 1 | -.8090 | | CM07006 |
| 520- | MPC | 1 | 7006 | 1 | -1. | 107000 | 1 | 1. | | |
| 521- | CM07006 | 1 | 107002 | 1 | 0. | 107004 | 1 | -1. | | CM07007 |
| 522- | MPC | 1 | 7007 | 1 | -1. | 107000 | 1 | 1. | | |
| 523- | CM07007 | 1 | 107002 | 1 | -.3090 | 107004 | 1 | -.8090 | | CM07008 |
| 524- | MPC | 1 | 7008 | 1 | -1. | 107000 | 1 | 1. | | |
| 525- | CM07008 | 1 | 107002 | 1 | -.5878 | 107004 | 1 | -.3090 | | CM07009 |
| 526- | MPC | 1 | 7009 | 1 | -1. | 107000 | 1 | 1. | | |
| 527- | CM07009 | 1 | 107002 | 1 | -.8090 | 107004 | 1 | -.3090 | | CM07010 |
| 528- | MPC | 1 | 7010 | 1 | -1. | 107000 | 1 | 1. | | |
| 529- | CM07010 | 1 | 107002 | 1 | -.9511 | 107004 | 1 | -.8090 | | CM07011 |
| 530- | MPC | 1 | 7011 | 1 | -1. | 107000 | 1 | 1. | | |
| 531- | CM07011 | 1 | 107002 | 1 | -1. | 107004 | 1 | 1. | | CM08001 |
| 532- | MPC | 1 | 8001 | 1 | -1. | 108000 | 1 | 1. | | |
| 533- | CM08001 | 1 | 108002 | 1 | 1. | 108004 | 1 | 1. | | CM08002 |
| 534- | MPC | 1 | 8002 | 1 | -1. | 108000 | 1 | 1. | | |
| 535- | CM08002 | 1 | 108002 | 1 | .9511 | 108004 | 1 | -.8090 | | CM08003 |
| 536- | MPC | 1 | 8003 | 1 | -1. | 108000 | 1 | 1. | | |
| 537- | CM08003 | 1 | 108002 | 1 | -.8090 | 108004 | 1 | -.3090 | | CM08004 |
| 538- | MPC | 1 | 8004 | 1 | -1. | 108000 | 1 | 1. | | |
| 539- | CM08004 | 1 | 108002 | 1 | -.5878 | 108004 | 1 | -.3090 | | CM08005 |
| 540- | MPC | 1 | 8005 | 1 | -1. | 108000 | 1 | 1. | | |
| 541- | CM08005 | 1 | 108002 | 1 | .3090 | 108004 | 1 | -.8090 | | CM08006 |
| 542- | MPC | 1 | 8006 | 1 | -1. | 108000 | 1 | 1. | | |
| 543- | CM08006 | 1 | 108002 | 1 | 0. | 108004 | 1 | -1. | | CM08007 |
| 544- | MPC | 1 | 8007 | 1 | -1. | 108000 | 1 | 1. | | |
| 545- | CM08007 | 1 | 108002 | 1 | -.3090 | 108004 | 1 | -.8090 | | CM08008 |
| 546- | MPC | 1 | 8008 | 1 | -1. | 108000 | 1 | 1. | | |
| 547- | CM08008 | 1 | 108002 | 1 | -.5878 | 108004 | 1 | -.3090 | | CM08009 |
| 548- | MPC | 1 | 8009 | 1 | -1. | 108000 | 1 | 1. | | |
| 549- | CM08009 | 1 | 108002 | 1 | -.8090 | 108004 | 1 | -.3090 | | CM08010 |
| 550- | MPC | 1 | 0010 | 1 | -1. | 108000 | 1 | 1. | | |

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| CARD
COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------------|---------|--------|---|---------|--------|---|---------|---|---|---------|
| 551- | CM08010 | 108002 | 1 | -0.9511 | 108004 | 1 | -0.8090 | | | CM08011 |
| 552- | MPC | 8011 | 1 | -1. | 108000 | 1 | 1. | | | |
| 553- | CM08011 | 108002 | 1 | -1. | 108004 | 1 | 1. | | | CM09001 |
| 554- | MPC | 9001 | 1 | -1. | 109000 | 1 | 1. | | | |
| 555- | CM09001 | 109002 | 1 | 1. | 109004 | 1 | 1. | | | CM09002 |
| 556- | MPC | 9002 | 1 | -1. | 109000 | 1 | 1. | | | |
| 557- | CM09002 | 109002 | 1 | -0.9511 | 109004 | 1 | -0.8090 | | | CM09003 |
| 558- | MPC | 9003 | 1 | -1. | 109000 | 1 | 1. | | | |
| 559- | CM09003 | 109002 | 1 | -0.8090 | 109004 | 1 | -0.3090 | | | CM09004 |
| 560- | MPC | 9004 | 1 | -1. | 109000 | 1 | 1. | | | |
| 561- | CM09004 | 109002 | 1 | -0.5878 | 109004 | 1 | -0.3090 | | | CM09005 |
| 562- | MPC | 9005 | 1 | -1. | 109000 | 1 | 1. | | | |
| 563- | CM09005 | 109002 | 1 | -0.3090 | 109004 | 1 | -0.8090 | | | CM09006 |
| 564- | MPC | 9006 | 1 | -1. | 109000 | 1 | 1. | | | |
| 565- | CM09006 | 109002 | 1 | 0. | 109004 | 1 | -1. | | | CM09007 |
| 566- | MPC | 9007 | 1 | -1. | 109000 | 1 | 1. | | | |
| 567- | CM09007 | 109002 | 1 | -0.3090 | 109004 | 1 | -0.8090 | | | CM09008 |
| 568- | MPC | 9008 | 1 | -1. | 109000 | 1 | 1. | | | |
| 569- | CM09008 | 109002 | 1 | -0.5878 | 109004 | 1 | -0.3090 | | | CM09009 |
| 570- | MPC | 9009 | 1 | -1. | 109000 | 1 | 1. | | | |
| 571- | CM09009 | 109002 | 1 | -0.8090 | 109004 | 1 | -0.3090 | | | CM09010 |
| 572- | MPC | 9010 | 1 | -1. | 109000 | 1 | 1. | | | |
| 573- | CM09010 | 109002 | 1 | -0.9511 | 109004 | 1 | -0.8090 | | | CM09011 |
| 574- | MPC | 9011 | 1 | -1. | 109000 | 1 | 1. | | | |
| 575- | CM09011 | 109002 | 1 | -1. | 109004 | 1 | 1. | | | CM10001 |
| 576- | MPC | 10001 | 1 | -1. | 110000 | 1 | 1. | | | |
| 577- | CM10001 | 110002 | 1 | 1. | 110004 | 1 | 1. | | | CM10002 |
| 578- | MPC | 10002 | 1 | -1. | 110000 | 1 | 1. | | | |
| 579- | CM10002 | 110002 | 1 | -0.9511 | 110004 | 1 | -0.8090 | | | CM10003 |
| 580- | MPC | 10003 | 1 | -1. | 110000 | 1 | 1. | | | |
| 581- | CM10003 | 110002 | 1 | -0.8090 | 110004 | 1 | -0.3090 | | | CM10004 |
| 582- | MPC | 10004 | 1 | -1. | 110000 | 1 | 1. | | | |
| 583- | CM10004 | 110002 | 1 | -0.5878 | 110004 | 1 | -0.3090 | | | CM10005 |
| 584- | MPC | 10005 | 1 | -1. | 110000 | 1 | 1. | | | |
| 585- | CM10005 | 110002 | 1 | -0.3090 | 110004 | 1 | -0.8090 | | | CM10006 |
| 586- | MPC | 10006 | 1 | -1. | 110000 | 1 | 1. | | | |
| 587- | CM10006 | 110002 | 1 | 0. | 110004 | 1 | -1. | | | CM10007 |
| 588- | MPC | 10007 | 1 | -1. | 110000 | 1 | 1. | | | |
| 589- | CM10007 | 110002 | 1 | -0.3090 | 110004 | 1 | -0.8090 | | | CM10008 |
| 590- | MPC | 10008 | 1 | -1. | 110000 | 1 | 1. | | | |
| 591- | CM10008 | 110002 | 1 | -0.5878 | 110004 | 1 | -0.3090 | | | CM10009 |
| 592- | MPC | 10009 | 1 | -1. | 110000 | 1 | 1. | | | |
| 593- | CM10009 | 110002 | 1 | -0.8090 | 110004 | 1 | -0.3090 | | | CM10010 |
| 594- | MPC | 10010 | 1 | -1. | 110000 | 1 | 1. | | | |
| 595- | CM10010 | 110002 | 1 | -0.9511 | 110004 | 1 | -0.8090 | | | CM10011 |
| 596- | MPC | 10011 | 1 | -1. | 110000 | 1 | 1. | | | |
| 597- | CM10011 | 110002 | 1 | -1. | 110004 | 1 | 1. | | | CM11001 |
| 598- | MPC | 11001 | 1 | -1. | 111000 | 1 | 1. | | | |
| 599- | CM11001 | 111002 | 1 | 1. | 111004 | 1 | 1. | | | CM11002 |
| 600- | MPC | 11002 | 1 | -1. | 111000 | 1 | 1. | | | |

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SORTED BULK DATA ECHO

| CARD
COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------------|---------|------|---------|------|---------|--------|---|-------|---|---------|
| 601- | CM11002 | 1 | 111002 | 1 | .9511 | 111004 | 1 | .8090 | | |
| 602- | MPC | 1 | 11003 | 1 | -1. | 111000 | 1 | 1. | | CM11003 |
| 603- | CM11003 | | 111002 | 1 | .8090 | 111004 | 1 | .3090 | | |
| 604- | MPC | 1 | 11004 | 1 | -1. | 111000 | 1 | 1. | | CM11004 |
| 605- | CM11004 | | 111002 | 1 | .5878 | 111004 | 1 | 1. | | CM11005 |
| 606- | MPC | 1 | 11005 | 1 | -1. | 111000 | 1 | 1. | | |
| 607- | CM11005 | | 111002 | 1 | .3090 | 111004 | 1 | 1. | | CM11006 |
| 608- | MPC | 1 | 11006 | 1 | -1. | 111000 | 1 | 1. | | |
| 609- | CM11006 | | 111002 | 1 | 0. | 111004 | 1 | 1. | | CM11007 |
| 610- | MPC | 1 | 11007 | 1 | -1. | 111000 | 1 | 1. | | |
| 611- | CM11007 | | 111002 | 1 | 1. | 111004 | 1 | 1. | | CM11008 |
| 612- | MPC | 1 | 11008 | 1 | -1. | 111000 | 1 | 1. | | |
| 613- | CM11008 | | 111002 | 1 | 1. | 111004 | 1 | 1. | | CM11009 |
| 614- | MPC | 1 | 11009 | 1 | -1. | 111000 | 1 | 1. | | |
| 615- | CM11009 | | 111002 | 1 | 1. | 111004 | 1 | 1. | | CM11010 |
| 616- | MPC | 1 | 11010 | 1 | -1. | 111000 | 1 | 1. | | |
| 617- | CM11010 | | 111002 | 1 | 1. | 111004 | 1 | 1. | | CM11011 |
| 618- | MPC | 1 | 11011 | 1 | -1. | 111000 | 1 | 1. | | |
| 619- | CM11011 | | 111002 | 1 | 1. | 111004 | 1 | 1. | | |
| 620- | CM111 | | 1000006 | THRU | 1000009 | | | | | |
| 621- | CM111 | | 1000011 | THRU | 1000014 | | | | | |
| 622- | CM111 | | 1000016 | THRU | 1000019 | | | | | |
| 623- | CM111 | | 1000021 | THRU | 1000024 | | | | | |
| 624- | CM111 | | 1000026 | THRU | 1000029 | | | | | |
| 625- | CM111 | | 1000031 | THRU | 1000034 | | | | | |
| 626- | CM111 | | 1000036 | THRU | 1000039 | | | | | |
| 627- | CM111 | | 1000041 | THRU | 1000044 | | | | | |
| 628- | CM111 | | 1000046 | THRU | 1000049 | | | | | |
| 629- | CM111 | | 1000051 | THRU | 1000054 | | | | | |
| 630- | CM111 | | 1000056 | THRU | 1000059 | | | | | |
| 631- | CM111 | | 1000061 | THRU | 1000064 | | | | | |
| 632- | CM111 | | 1000066 | THRU | 1000069 | | | | | |
| 633- | CM111 | | 1000071 | THRU | 1000074 | | | | | |
| 634- | CM111 | | 1000076 | THRU | 1000079 | | | | | |
| 635- | CM111 | | 1000081 | THRU | 1000084 | | | | | |
| 636- | CM111 | | 1000086 | THRU | 1000089 | | | | | |
| 637- | CM111 | | 1000091 | THRU | 1000094 | | | | | |
| 638- | CM111 | | 1000096 | THRU | 1000099 | | | | | |
| 639- | CM111 | | 1000101 | THRU | 1000104 | | | | | |
| 640- | CM111 | | 1000106 | THRU | 1000109 | | | | | |
| 641- | CM111 | | 1000111 | THRU | 1000114 | | | | | |
| 642- | CM111 | | 1000116 | THRU | 1000119 | | | | | |
| 643- | CM111 | | 1000121 | THRU | 1000124 | | | | | |
| 644- | CM111 | | 1000126 | THRU | 1000129 | | | | | |
| 645- | CM111 | | 1000131 | THRU | 1000134 | | | | | |
| 646- | CM111 | | 1000136 | THRU | 1000139 | | | | | |
| 647- | CM111 | | 1000141 | THRU | 1000144 | | | | | |
| 648- | CM111 | | 1000146 | THRU | 1000149 | | | | | |
| 649- | CM111 | | 1000151 | THRU | 1000154 | | | | | |
| 650- | PARAM | A999 | 4.0 | .0 | | | | | | |

CYLINDRICAL FLUID

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SORTED BULK DATA ECHO

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|-----------|----|---|-----|----|----|---|-----|---|----|
| COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 651- | RINGFL 1 | .2 | | | 1. | .4 | | 1. | | |
| 652- | RINGFL 3 | .6 | | 1. | 4 | .8 | | 1. | | |
| 653- | RINGFL 5 | 1. | | 1. | 6 | .2 | | .8 | | |
| 654- | RINGFL 7 | .4 | | .8 | 8 | .6 | | .8 | | |
| 655- | RINGFL 9 | .8 | | .8 | 10 | 1. | | .8 | | |
| 656- | RINGFL 11 | .2 | | .6 | 12 | .4 | | .6 | | |
| 657- | RINGFL 13 | .6 | | .6 | 14 | .8 | | .6 | | |
| 658- | RINGFL 15 | 1. | | .6 | 16 | .2 | | .4 | | |
| 659- | RINGFL 17 | .4 | | .4 | 18 | .6 | | .4 | | |
| 660- | RINGFL 19 | .8 | | .4 | 20 | 1. | | .4 | | |
| 661- | RINGFL 21 | .2 | | .2 | 22 | .4 | | .2 | | |
| 662- | RINGFL 23 | .6 | | .2 | 24 | .8 | | .2 | | |
| 663- | RINGFL 25 | 1. | | .2 | 26 | .2 | | 0.0 | | |
| 664- | RINGFL 27 | .4 | | 0.0 | 28 | .6 | | 0.0 | | |
| 665- | RINGFL 29 | .8 | | 0.0 | 30 | 1. | | 0.0 | | |
| 666- | RINGFL 31 | .2 | | .2 | 32 | .4 | | .2 | | |
| 667- | RINGFL 33 | .6 | | .2 | 34 | .8 | | .2 | | |
| 668- | RINGFL 35 | 1. | | .2 | 36 | .2 | | .4 | | |
| 669- | RINGFL 37 | .4 | | .4 | 38 | .6 | | .4 | | |
| 670- | RINGFL 39 | .8 | | .4 | 40 | 1. | | .4 | | |
| 671- | RINGFL 41 | .2 | | .6 | 42 | .4 | | .6 | | |
| 672- | RINGFL 43 | .6 | | .6 | 44 | .8 | | .6 | | |
| 673- | RINGFL 45 | 1. | | .6 | 46 | .2 | | .8 | | |
| 674- | RINGFL 47 | .4 | | .8 | 48 | .6 | | .8 | | |
| 675- | RINGFL 49 | .8 | | .8 | 50 | 1. | | .8 | | |
| 676- | RINGFL 51 | .2 | | .1. | 52 | .4 | | .1. | | |
| 677- | RINGFL 53 | .6 | | .1. | 54 | .8 | | .1. | | |
| 678- | RINGFL 55 | 1. | | .1. | | | | | | |
| | ENDDATA | | | | | | | | | |

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N
DMAP-DMAP INSTRUCTION
NO.

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1 BEGIN      NO.7 DIRECT COMPLEX EIGENVALUE ANALYSIS - SERIES M1 $
2 FILE      KGGXTAPE/ KGGXTAPE/ GOD#SAVE/ GMD#SAVE $
3 GPI       FOM1.GEOM2./GPL.EOEEXIN.GPDT.CSTM.RGPDY.SIL/V.N.LUSET/ C.N.
           123/V.N.NOGPDT $
4 SAVE      LUSET.NOGPDT $
5 PURGE      USET.GM.GN.KAA.DAA.MAA.KAAA.KFS.EST.ECT.PLTSETX.PLTIPAR.GPSETS.
           ELSETS/NOGPDT $
6 CHKPNT     GPL.EOEEXIN.GPDT.CSTM.BGPDY.SIL.USET.GM.GN.KAA.BAA.MAA.KAAA.EST.
           ECT.PLTSETX.PLTIPAR.GPSETS.ELSETS $
7 COND      LBL5.NOGPDT $
8 GP2       GEOM2.EOEEXIN/ECT $
9 CHKPNT     ECT $
10 PLTSET     PCDB.EOEEXIN.ECT/PLTSETX.PLTIPAR.GPSETS.ELSETS/V.N.NSIL/ V.N.
           JUMPPLOT $
11 SAVE      NSIL.JUMPPLOT $
12 PRMSG     PLTSETX// $
13 SETVAL    //V.N.PLTFLG/C.N.1/V.N.PFILE/C.N.0 $
14 SAVE      PLTFLG.PFILE $
15 COND      P1.JUMPPLOT $
16 PLOT      PLTIPAR.GPSETS.ELSETS.CASECC.BGPDY.EOEEXIN.SIL./PLOTX1/ V.N.
           NSIL/V.N.LUSET/V.N.JUMPPLOT/V.N.PLTFLG/V.N.PFILE $
17 SAVE      PFILE $
18 PRMSG     PLOTX1// $
19 LABEL     P1 $
20 CHKPNT     PLTIPAR.GPSETS.ELSETS $
21 GP3       GEOM3.EOEEXIN.GEOM2/GPDT/C.N.123/V.N.NOGRAV/C.N.123 $
22 CHKPNT     GPDT $

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2/ 1/73

NASTRAN

APRIL 9, 1974

COMPI LATION

PROGRAM

SOURCE

INSTRUCTION

NO.

DAP-DMAP

23 TAI. .ECT.EPT.BGPD.T.SIL.GPTT.CSTM/EST..GEI.ECPT.GPCT/V.N.LUSET/ C.N.
123/V.N.NOSIMP#-1/C.N.O/V.N.NOGENL#-1/V.N.GENEL \$

24 SAVE .NOSIMP.NOGENL.GENEL \$

25 PURGE .K4GG.GPST.OGPST.MGG.BGG.K4NN.K4FF.K4AA.MNN.MFF.MAA.BNN.BFF.BAA.
KGGX/NOSIMP / OGPST/GENEL \$

26 CHKPNT .EST.ECPT.GPCT.GEI.K4GG.GPST.MGG.BGG.KGGX.OGPST. K4NN.K4FF.
K4AA.MNN.MFF.MAA.BNN.BFF.BAA \$

27 COND .LBL1.NOSIMP \$

28 SMA1 .CSTM.MPT.ECPT.GPCT.DIT/KGGX.K4GG.GPST/V.N.NOGENL/V.N.NOK4GG \$

29 SAVE .NOK4GG \$

30 PURGE .K4NN.K4FF.K4AA/NOK4GG \$

31 CHKPNT .KGGX.GPST.K4GG.K4NN.K4FF.K4AA \$

32 SMA2 .CSTM.MPT.ECPT.GPCT.DIT/MGG.BGG/V.Y.WTMASS#1.0/V.N.NOMGG/ V.N.
NOBGG#-1/V.Y.COUPMASS/V.Y.CPBAR/V.Y.CPROD/V.Y.CQUAD1/ V.Y.
CQUAD2/V.Y.CPTRIAL/V.Y.CPTRIAL2/V.Y.CPTUBE/V.Y.CPODPLT/ V.Y.
CPTRPLT/V.Y.CPTRBSC \$

33 SAVE .NOMGG.NOBGG \$

34 PURGE .BNN.BFF.BAA/NOBGG/MNN.MFF.MAA/NOMGG \$

35 CHKPNT .MGG.MNN.MFF.MAA.BGG.BNN.BFF.BAA \$

36 COND .LBL1.GRDPNT \$

37 COND .ERROR3.NOMGG \$

38 GPWG .BGPD.T.CSTM.EQEXIN.MGG/OGPWG/V.Y.GRDPNT#-1/V.Y.WTMASS \$

39 OFP .OGPWG...../V.N.CARDNO \$

40 SAVE .CARDNO \$

41 LABEL .LBL1 \$

42 EQUIV .KGGX.KGG/NOGENL \$

43 CHKPNT .KGG \$

44 COND .LBL1.NOGENL \$

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45 SMA3 GE1,KGGX/KGG/V,N,LUSET/V,N,NDGENL/V,N,NOSIMP $
46 CHKPNT KGG $
47 LABEL LBL11 $
48 PARAM //C,N,MPY/V,N,NSKIP/C,N,0/C,N,0 $
49 GP4 CASECC,GEOM4,EDEXIN,SIL,GPDT/RG,,USET,/V,N,LUSET/V,N,MPCF1/V,
N,MPCF2/V,N,SINGLE/V,N,OMIT/V,N,REACT/V,N,NSKIP/V,N,REPEAT/
V,N,NOSIMP-1/V,N,NUL/V,N,NOA#-1 $
50 SAVE MPCF1,MPCF2,SINGLE,OMIT,NSKIP,NOSIMP,REACT,REPEAT,NOL,NDA $
50 MATGPR GPL,USET,SIL,MGG//C,N,G
50 MATGPR GPL,USET,SIL,KGG//C,N,G
51 PURGE GM,GMD/MPCF1/GO,GOD/OMIT/KFS,QPC/SINGLE $
52 EQUIV KGG,KNN/MPCF1/MGG,MNN/MPCF1/ BGG,BNN/MPCF1/KGGG,KANN/MPCF1 $
53 CHKPNT GM,GMD,RG,GD,GD,KFS,QPC,USET,KNN,MNN,BNN,KANN $
54 COND LBL4,GENEL $
55 COND LBL4,NOSIMP $
56 GPSP GPL,GPST,USET,SIL/OGPST $
57 QFP OGPST,,,,,/V,N,CARDNO $
58 SAVE CARDNO $
59 LABEL LBL4 $
60 COND LBL2,MPCF2 $
61 MCE1 USET,RG/GM $
62 CHKPNT GM $
63 MCE2 USET,GM,KGG,MGG,BGG,KAGG/KNN,MNN,BNN,KANN $
64 CHKPNT KNN,MNN,BNN,KANN $
65 LABEL LBL2 $
66 EQUIV KNN,KFF/SINGLE/MNN,MFF/SINGLE/BNN,BFF/SINGLE/KANN,K4FF/SINGLE $

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CYLINDRICAL FLUID
 NASTRAN SOURCE PROGRAM COMPILATION
 DMAP-DMAP INSTRUCTION NO.

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67  CKPNT  KFF,MFF,BFF,K4FF $
68  COND  LBL3,SINGLE $
69  SCE1   USET,KNN,MNN,BNN,K4NN/KFF,KFS,,MFF,BFF,K4FF $
70  CKPNT  KFS,KFF,MFF,BFF,K4FF $
71  LABEL  LBL3 $
72  EQUIV  KFF,KAA/OMIT/ MFF,MAA/OMIT/BFF,BAA/OMIT/K4FF,K4AA/OMIT $
73  CKPNT  KAA,MAA,BAA,K4AA $
73  MATGPR GPL,USET,SIL,MFF//C,N,F
73  MATGPR GPL,USET,SIL,KFF//C,N,F
74  COND  LRL5,OMIT $
75  SMP1   USET,KFF,,,/GD,KAA,K00,L00,U00,,,, $
76  CKPNT  GO,KAA $
77  COND  LBLM,NOMGG $
78  SMP2   USET,GO,MFF/MAA $
79  CKPNT  MAA $
80  LABEL  LBLM $
81  COND  LBLB,NOMGG $
82  SMP2   USET,GO,BFF/BAA $
83  CKPNT  BAA $
84  LABEL  LBLB $
85  COND  LBL5,NOK4GG $
86  SMP2   USET,GO,K4FF/K4AA $
87  CKPNT  K4AA $
88  LABEL  LBL5 $
89  OPD    DYNAMICS,GPL,SIL,USET/GPLD,SILD,USETD,TFPDOL,,,,,EED,EODYN/V,
          N,USET/V,N,USETD/V,N,NOTFL/V,N,NODLT/V,N,NOPSDL/V,N,NDFRL/

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NASTRAN SOURCE PROGRAM COMPILATION

DNAP-DNAP INSTRUCTION

NO.

V.N.NONLFT/V.N.NOTRL/V.N.NOEDD/C.N.123/V.N.NOUE \$

V.N.NONLFT/V.N.NOTRL/V.N.NOEDD/C.N.123/V.N.NOUE \$

90 SAVE LUSETD.NOUE \$

91 EQUIV GO.GOD/NOUE/GM.GMD/NOUE \$

92 CHKPNT USETD.EED.EODYN.TFPOOL.GDD.GMD.SILD.GPLD \$

93 PARAM //C.N.ADD/V.N.NEVER/C.N.1/C.N.0 \$

94 PARAM //C.N.MPY/V.N.REPEATE/C.N.1/C.N.-1 \$

95 BMG MATPOOL.BGPD.T.EQEXIN.CSTM/BDPOOL/V.N.NOKBFL/V.N.NOABFL/V.N.

96 SAVE MFACT.NOKBFL.NOABFL \$

97 PARAM //C.N.AND/V.N.NOFL/V.N.NOABFL/V.N.NOKBFL \$

98 PURGE KBFL/NOKBFL/ ABFL/NOABFL \$

99 COND LBLFL3.NOFL \$

100 MTRXIN .BDPOOL.EODYN.. /ABFL.KBFL./V.N.LUSETD/V.N.NOABFL/V.N.NOKBFL/C.

101 SAVE NOABFL.NOKBFL \$

101 MATGPR GPL.USET.SIL.ABFL//C.N.P

101 MATGPR GPL.USET.SIL.KBFL//C.N.P

102 LABEL LBLFL3 \$

103 CHKPNT ABFL.KBFL \$

104 JUMP LBL13 \$

105 LABEL LBL13 \$

106 PURGE PH10.GLAWA.GPH10.OBPC1.OCPMP.OESC1.OEFC1.CPH1P.OPC. K2PP.

107 CASE CASECC./CASEXX/C.N.CEIGN/V.N.REPEATE/V.N.NOLOOP \$

108 SAVE REPEATE.NOLOOP \$

109 CHKPNT CASEXX \$

110 MTRXIN CASEXX.MATPOOL.EODYN..TFPOOL/K2DPP.M2DPP/V.N.LUSETD/V.N.

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NASTRAN SOURCE PROGRAM COMPILATION

DMAP-DMAP INSTRUCTION

NO.

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111 SAVE NOK2DPP,NOM2DPP,NOB2PP $
112 PARAM //C,N,AND/V,N,NOM2PP/V,N,NDA8FL/V,N,NOM2DPP $
113 PARAM //C,N,AND/V,N,NOK2PP/V,N,NDFL/V,N,NOK2DPP $
114 EQUIV K2DPP,K2XPP,NOK8FL, M2DPP,M2PP,NDA8FL $
115 COND LBLFL1,NOK8FL $
116 EQUIV K8FL,K2XPP,NOK2DPP $
117 COND LBLFL1,NOK2DPP $
118 ADD K8FL,K2DPP,K2XPP $
119 LABEL LBLFL1 $
120 EQUIV K2XPP,K2PP,NDA8FL $
121 COND LBLFL2,NDA8FL $
122 ADD ABFL,K2XPP,K2PP/C,N,X-1.0,0.0 $
123 TRNSP ABFL/ABFL $
124 ADD ABFLT,M2DPP,M2PP/V,N,MFACT $
125 LABEL LBLFL2 $
126 PARAM //C,N,AND/V,N,BDE8A/V,N,NQUE/V,N,NOB2PP $
127 PARAM //C,N,AND/V,N,NDEMA/V,N,NQUE/V,N,NOM2PP $
128 PARAM //C,N,AND/V,N,KDEK2/V,N,NOGENL/V,N,NOSIMP $
129 PURGE K2DD/NOM2PP/M2ED/NOM2PP/B2DD/NOM2PP $
130 EQUIV M2PP,M2DD,NDA/B2PP,B2DD/NDA/K2PP,K2DD/NDA/MAA,MDD/MDEMA/BAA,
      BDD/BDE8A $
131 CHKPT K2PP,M2PP,B2PP,K2DD,M2DD,B2DD,BDD,MDD $
132 COND LBL18,NCGPOT $
133 GKAD USETD,GM,GO,KAA,BAA,MAA,KAAA,K2PP,M2PP,B2PP/KDD,BDD,MDD,GMD,
      GOD,K2DD,M2DD,B2DD/C,N,CMPLEV/C,N,DISP/C,N,DIRECT/C,Y,GPO,0/C,
      N,0,0/C,N,0,0/V,N,NOK2PP/V,N,NOM2PP/V,N,NOB2PP/V,N,NPCF1/V,

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NASTRAN SOURCE PROGRAM COMPI LATION

DMAP-DMAP INSTRUCTION

ND.

N.SINGLE/V.N.OMIT/V.N.NDUE/V.N.NOKAGG/V.N.NDBGG/V.N.KDEK2/C.N.

-1 \$

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134 LABEL LHL18 $
135 EQUIV B2DD,BDD/NOBGG/ M2DD,MDD/ND5IMP/ K2DD,KDD/KDEK2 $
136 CHKPNT KDD,BDD,MDD,GDD,GMD $
136 MATGPR GPLD,USETD,SILD,MDD//C.N.D
136 MATGPR GPLD,USETD,SILD,KDD//C.N.D
136 SEEMAT MGG,KGG,MFF,KFF,ABFL//C.N.PRINT
136 SEEMAT KBFL,MDD,KDD,./C.N.PRINT
136 PARTN KDD,P9./KBP,AEM,KE/C.N.-1 $
136 PARTN KBP,G9./K11,K21,K12,K22/C.N.-1 $
136 PARTN AEM,G9,UP/AIM,./A2M/C.N.1 $
136 PARTN KE,UP,KE1,./KE2/C.N.-1 $
136 TRNSP A2M/A2MT $
136 SOLVE K22,A2MT/PDU2/C.N.1/C.N.-1 $
136 SOLVE AIM,K12/M2L/C.N.1 $
136 MPYAD M2L,PDU2./TU12/C.N.0/C.N.-1 $
136 ADD PDU2./PDU3/C.Y.A999#%1.0,0.0H $
136 PARAM //C.N.NOP/V.N.TRUE#-1 $
136 EQUIV PDU3,PDU2/TRUE $
136 COND POUN09,TRUE $
136 MATPRN PDU3,././ $
136 LABEL PDUN09 $
136 MPYAD A2M,PDU2./MFLD/C.N.0/C.N.-1 $
136 OUTPUT3 MFLD,PDU2,TU12,./C.N.0/C.Y.N1#AMF/C.Y.N2#APD/C.Y.N3#ATU $
136 SHPYAD TU12,KE1,TU12,./KE2/KEB/C.N.3/C.N.1/C.N.1/C.N.2/C.N.1 $

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CYLINDRICAL FLOID

NASTRAN SOURCE PROGRAM COMPILATION

DMAP-DMAP INSTRUCTION

NO.

136 SOLVE K22,K21/CP2/C.N.1/C.N.-1 \$

136 MATPRN K11,K12,K22,.,.,. \$

136 MATPRN A1M,A2M,KE1,.,.,. \$

136 MATPRN PDU2,MFLD,TU12,.,.,. \$

136 MATPRN KEB,K11,CP2,.,.,. \$

136 EXIT

137 COND ERROR1,NUDEED \$

138 CEAD KOD,BDD,NDD,EED,CASEXX/PHID,CLAMA,OCEIGS/V,N,EIGVS \$

139 SAVE EIGVS \$

140 CHKPNT PHID,CLAMA,OCEIGS \$

141 OFP OCEIGS,CLAMA,.,.,./V,N,CARDNO \$

142 SAVE CARDNO \$

143 COND LBL16,EIGVS \$

144 VDR CASEXX,EODYN,USED,PHID,CLAMA,.,./PHID,/C.N,CEIGN/C.N,DIRECTAC,
N,0/V,N,NDD/V,N,NOP/C,N,0 \$

145 SAVE NOD,NOP \$

146 COND LBL15,NOD \$

147 OFP OPHID,.,.,./V,N,CARDNO \$

148 SAVE CARDNO \$

149 LABEL LBL15 \$

150 COND LBL16,NOP \$

151 EQUIV PHID,CPHIP/NOA \$

152 COND LBL17,NOA \$

153 SDR1 USETG,., PHID,.,GOD,GMD,KFS,.,/CPHIP,.,QPC/C.N.1/C.N,DYNAMICS \$

154 LABEL LBL17 \$

155 CHKPNT CPHIP,QPC \$

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APRIL 9. 1976

NASTRAN 2/ 1/73

NASTRAN SOURCE PROGRAM COMPILATION

DMAP-DMAP INSTRUCTION
ND.156 SDR2 CASEXX,CSTM,MPT,DIT,EODYN,SILO,...CLAMA,OPC,CPHIP,EST,/,00PGI,
DCPHIP,DESCI,DEFC1,/C,N,CEIG \$

157 QFP DCPHIP,00PC1,DEFC1,DESC1,/,/V,N,CARDND \$

158 SAVE CARDND \$

159 LABEL LBL16 \$

160 COND FINIS,REPEAT \$

161 REPT LBL13,100 \$

162 JUMP ERROR2 \$

163 JUMP FINIS \$

164 LABEL ERROR2 \$

165 PRTPARM //C,N,-2/C,N,DIRCEAD \$

166 LABEL ERROR1 \$

167 PRTPARM //C,N,-1/C,N,DIRCEAD \$

168 LABEL ERROR3 \$

169 PRTPARM //C,N,-3/C,N,DIRCEAD \$

170 LABEL FINIS \$

171 END \$

NO ERRORS FOUND - EXECUTE NASTRAN PROGRAM

APRIL 11, 1974 NASTRAN 5/13/72

NASTRAN EXECUTIVE CONTROL DECK ECHO

ID-CAP60,COPPOLINO

APP DISP

SOL 3.0

TIME 20

DIAG 2

DIAG 7.8.13.14.19.21.22

ALTER 74

ADD MAA,MFLD/MAH \$

PARAM //C.N.NOP/V.N.TRUE==1 \$

LDUIV MAH,MAA/TRUE \$

CUND MAHNO9.TRUE \$

MATPRN MAH,.,.,./// \$

LABEL MAHNO9 \$

ALTER 88

SEEMAT VGG,KGG,.,.,./C.N.PRINT

ALTER 91

MATUPN GPL, USET, SIL, PHIA//C.N.A

ALTER 107

SMPLYAD PHIA,KAA,PHIA,.,.,/KH/C.N.3/C.N.1/C.N.1/C.N.2/C.N.1 \$

SOLVE MI,KH/WH/C.N.1 \$

SMPLYAD PD02,PHIA,WH,.,.,/PD2/C.N.3 \$

MPYAD TU12,PHIA,/PHF/C.N.0 \$

MATPRN WH,PD2,PHF,.,.,./// \$

ENDALTER

CEND

ORIGINAL PAGE IS
OF POOR QUALITY

AXIS SYMMETRIC CIRC. CYL. WITH FLUID
HARMONIC REDUCTION

APRIL 11, 1974 NASTRAN 5/13/72

CASE CONTROL DECK ECHO

CARD
COUNT

1 TITLE=AXISYMMETRIC CIRC. CYL. WITH FLUID
2 SUBTTITLE=HARMONIC REDUCTION
3 MAXLINES=120000
4 SPC=1
5 MPC=1
6 METHOD=1
7 VECTOR=ALL
8 BEGIN BULK

*** USER INFORMATION MESSAGE 207. BULK DATA NOT SORTED.XSORT WILL RE-ORDER DECK.

SORTED BULK DATA ECHO

| CARD
COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------------|------------|----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1- | CORD2C 1 | 0. | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 2- | CCDC 1 | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| 3- | CQUAD2 2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 4- | CQUAD2 3 | 1 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 5- | CQUAD2 4 | 1 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 6- | CQUAD2 5 | 1 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 7- | CQUAD2 6 | 1 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| 8- | CQUAD2 7 | 1 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 9- | CQUAD2 8 | 1 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 10- | CQUAD2 9 | 1 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 11- | CQUAD2 10 | 1 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 12- | CQUAD2 11 | 1 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 13- | CQUAD2 12 | 1 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 14- | CQUAD2 13 | 1 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 15- | CQUAD2 14 | 1 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 16- | CQUAD2 15 | 1 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| 17- | CQUAD2 16 | 1 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| 18- | CQUAD2 17 | 1 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 19- | CQUAD2 18 | 1 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 20- | CQUAD2 19 | 1 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| 21- | CQUAD2 20 | 1 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| 22- | CQUAD2 21 | 1 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 23- | CQUAD2 22 | 1 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 |
| 24- | CQUAD2 23 | 1 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 25- | CQUAD2 24 | 1 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
| 26- | CQUAD2 25 | 1 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 |
| 27- | CQUAD2 26 | 1 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 |
| 28- | CQUAD2 27 | 1 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 |
| 29- | CQUAD2 28 | 1 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 |
| 30- | CQUAD2 29 | 1 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 |
| 31- | CQUAD2 30 | 1 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 |
| 32- | CQUAD2 31 | 1 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 |
| 33- | CQUAD2 32 | 1 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 |
| 34- | CQUAD2 33 | 1 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 35- | CQUAD2 34 | 1 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 |
| 36- | CQUAD2 35 | 1 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 |
| 37- | CQUAD2 36 | 1 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 |
| 38- | CQUAD2 37 | 1 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 |
| 39- | CQUAD2 38 | 1 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 |
| 40- | CQUAD2 39 | 1 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 |
| 41- | CQUAD2 40 | 1 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 |
| 42- | CQUAD2 41 | 1 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 |
| 43- | CQUAD2 42 | 1 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 |
| 44- | CQUAD2 43 | 1 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 45- | CQUAD2 44 | 1 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 |
| 46- | CQUAD2 45 | 1 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 |
| 47- | CQUAD2 46 | 1 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 |
| 48- | CQUAD2 47 | 1 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 |
| 49- | CQUAD2 48 | 1 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 |
| 50- | CQUAD2 49 | 1 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 |
| 51- | CQUAD2 50 | 1 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 |
| 52- | CQUAD2 51 | 1 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 |
| 53- | CQUAD2 52 | 1 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 |
| 54- | CQUAD2 53 | 1 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 55- | CQUAD2 54 | 1 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 |
| 56- | CQUAD2 55 | 1 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 |
| 57- | CQUAD2 56 | 1 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 |
| 58- | CQUAD2 57 | 1 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 |
| 59- | CQUAD2 58 | 1 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 |
| 60- | CQUAD2 59 | 1 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 |
| 61- | CQUAD2 60 | 1 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 |
| 62- | CQUAD2 61 | 1 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 |
| 63- | CQUAD2 62 | 1 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 |
| 64- | CQUAD2 63 | 1 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 65- | CQUAD2 64 | 1 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 |
| 66- | CQUAD2 65 | 1 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 |
| 67- | CQUAD2 66 | 1 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 |
| 68- | CQUAD2 67 | 1 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 |
| 69- | CQUAD2 68 | 1 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 |
| 70- | CQUAD2 69 | 1 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 |
| 71- | CQUAD2 70 | 1 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 |
| 72- | CQUAD2 71 | 1 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 |
| 73- | CQUAD2 72 | 1 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 |
| 74- | CQUAD2 73 | 1 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 75- | CQUAD2 74 | 1 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 |
| 76- | CQUAD2 75 | 1 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 |
| 77- | CQUAD2 76 | 1 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 |
| 78- | CQUAD2 77 | 1 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 |
| 79- | CQUAD2 78 | 1 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 |
| 80- | CQUAD2 79 | 1 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 |
| 81- | CQUAD2 80 | 1 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 |
| 82- | CQUAD2 81 | 1 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 |
| 83- | CQUAD2 82 | 1 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 |
| 84- | CQUAD2 83 | 1 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 85- | CQUAD2 84 | 1 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 |
| 86- | CQUAD2 85 | 1 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 |
| 87- | CQUAD2 86 | 1 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 |
| 88- | CQUAD2 87 | 1 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 |
| 89- | CQUAD2 88 | 1 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 |
| 90- | CQUAD2 89 | 1 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 |
| 91- | CQUAD2 90 | 1 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 |
| 92- | CQUAD2 91 | 1 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 |
| 93- | CQUAD2 92 | 1 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 |
| 94- | CQUAD2 93 | 1 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |
| 95- | CQUAD2 94 | 1 | 94 | 95 | 96 | 97 | 98 | 99 | 100 | 101 |
| 96- | CQUAD2 95 | 1 | 95 | 96 | 97 | 98 | 99 | 100 | 101 | 102 |
| 97- | CQUAD2 96 | 1 | 96 | 97 | 98 | 99 | 100 | 101 | 102 | 103 |
| 98- | CQUAD2 97 | 1 | 97 | 98 | 99 | 100 | 101 | 102 | 103 | 104 |
| 99- | CQUAD2 98 | 1 | 98 | 99 | 100 | 101 | 102 | 103 | 104 | 105 |
| 100- | CQUAD2 99 | 1 | 99 | 100 | 101 | 102 | 103 | 104 | 105 | 106 |
| 101- | CQUAD2 100 | 1 | 100 | 101 | 102 | 103 | 104 | 105 | 106 | 107 |
| 102- | CQUAD2 101 | 1 | 101 | 102 | 103 | 104 | 105 | 106 | 107 | 108 |
| 103- | CQUAD2 102 | 1 | 102 | 103 | 104 | 105 | 106 | 107 | 108 | 109 |
| 104- | CQUAD2 103 | 1 | 103 | 104 | 105 | 106 | 107 | 108 | 109 | 110 |
| 105- | CQUAD2 104 | 1 | 104 | 105 | 106 | 107 | 108 | 109 | 110 | 111 |
| 106- | CQUAD2 105 | 1 | 105 | 106 | 107 | 108 | 109 | 110 | 111 | 112 |
| 107- | CQUAD2 106 | 1 | 106 | 107 | 108 | 109 | 110 | 111 | 112 | 113 |
| 108- | CQUAD2 107 | 1 | 107 | 108 | 109 | 110 | 111 | 112 | 113 | 114 |
| 109- | CQUAD2 108 | 1 | 108 | 109 | 110 | 111 | 112 | 113 | 114 | 115 |
| 110- | CQUAD2 109 | 1 | 109 | 110 | 111 | 112 | 113 | 114 | 115 | 116 |
| 111- | CQUAD2 110 | 1 | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 |
| 112- | CQUAD2 111 | 1 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 |
| 113- | CQUAD2 112 | 1 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 |
| 114- | CQUAD2 113 | 1 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 |
| 115- | CQUAD2 114 | 1 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 |
| 116- | CQUAD2 115 | 1 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | 122 |
| 117- | CQUAD2 116 | 1 | 116 | 117 | 118 | 119 | 120 | 121 | 122 | 123 |
| 118- | CQUAD2 117 | 1 | 117 | 118 | 119 | 120 | 121 | 122 | 123 | 124 |
| 119- | CQUAD2 118 | 1 | 118 | 119 | 120 | 121 | 122 | 123 | 124 | 125 |
| 120- | CQUAD2 119 | 1 | 119 | 120 | 121 | 122 | 123 | 124 | 125 | 126 |
| 121- | CQUAD2 120 | 1 | 120 | 121 | 122 | 123 | 124 | 125 | 126 | 127 |
| 122- | CQUAD2 121 | 1 | 121 | 122 | 123 | 124 | 125 | 126 | 127 | 128 |
| 123- | CQUAD2 122 | 1 | 122 | 123 | 124 | 125 | 126 | 127 | 128 | 129 |
| 124- | CQUAD2 123 | 1 | 123 | 124 | 125 | 126 | 127 | 128 | 129 | 130 |
| 125- | CQUAD2 124 | 1 | 124 | 125 | 126 | 127 | 128 | 129 | 130 | 131 |
| 126- | CQUAD2 125 | 1 | 125 | 126 | 127 | 128 | 129 | 130 | 131 | 132 |
| 127- | CQUAD2 126 | 1 | 126 | 127 | 128 | 129 | 130 | 131 | 132 | 133 |
| 128- | CQUAD2 127 | 1 | 127 | 128 | 129 | 130 | 131 | 132 | 133 | 134 |
| 129- | CQUAD2 128 | 1 | 128 | 129 | 130 | 131 | 132 | 133 | 134 | 135 |
| 130- | CQUAD2 129 | 1 | 129 | 130 | 131 | 132 | 133 | 134 | 135 | 136 |
| 131- | CQUAD2 130 | 1 | 130 | 131 | 132 | 133 | 134 | 135 | 136 | 137 |
| 132- | CQUAD2 131 | 1 | 131 | 132 | 133 | 134 | 135 | 136 | 137 | 138 |
| 133- | CQUAD2 132 | 1 | 132 | 133 | 134 | 135 | 136 | 137 | 138 | 139 |
| 134- | CQUAD2 133 | 1 | 133 | 134 | 135 | 136 | 137 | 138 | 139 | 140 |
| 135- | CQUAD2 134 | 1 | 134 | 135 | 136 | 137 | 138 | 139 | 140 | 141 |
| 136- | CQUAD2 135 | 1 | 135 | 136 | 137 | 138 | 139 | 140 | 141 | 142 |
| 137- | CQUAD2 136 | 1 | 136 | 137 | | | | | | |

SORTED BULK DATA ECHO

| CARD
COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------------|--------|-----|-----|-----|-----|-----|-----|---|---|----|
| 51- | COUAD2 | 54 | 54 | 55 | 55 | 66 | 65 | | | |
| 52- | COUAD2 | 55 | 55 | 56 | 56 | 67 | 66 | | | |
| 53- | COUAD2 | 57 | 57 | 58 | 58 | 69 | 68 | | | |
| 54- | COUAD2 | 58 | 58 | 59 | 59 | 70 | 69 | | | |
| 55- | COUAD2 | 59 | 59 | 60 | 60 | 71 | 70 | | | |
| 56- | COUAD2 | 60 | 60 | 61 | 61 | 72 | 71 | | | |
| 57- | COUAD2 | 61 | 61 | 62 | 62 | 73 | 72 | | | |
| 58- | COUAD2 | 62 | 62 | 63 | 63 | 74 | 73 | | | |
| 59- | COUAD2 | 63 | 63 | 64 | 64 | 75 | 74 | | | |
| 60- | COUAD2 | 64 | 64 | 65 | 65 | 76 | 75 | | | |
| 61- | COUAD2 | 65 | 65 | 66 | 66 | 77 | 76 | | | |
| 62- | COUAD2 | 66 | 66 | 67 | 67 | 78 | 77 | | | |
| 63- | COUAD2 | 68 | 68 | 69 | 69 | 80 | 79 | | | |
| 64- | COUAD2 | 69 | 69 | 70 | 70 | 81 | 80 | | | |
| 65- | COUAD2 | 70 | 70 | 71 | 71 | 82 | 81 | | | |
| 66- | COUAD2 | 71 | 71 | 72 | 72 | 83 | 82 | | | |
| 67- | COUAD2 | 72 | 72 | 73 | 73 | 84 | 83 | | | |
| 68- | COUAD2 | 73 | 73 | 74 | 74 | 85 | 84 | | | |
| 69- | COUAD2 | 74 | 74 | 75 | 75 | 86 | 85 | | | |
| 70- | COUAD2 | 75 | 75 | 76 | 76 | 87 | 86 | | | |
| 71- | COUAD2 | 76 | 76 | 77 | 77 | 88 | 87 | | | |
| 72- | COUAD2 | 77 | 77 | 78 | 78 | 89 | 88 | | | |
| 73- | COUAD2 | 79 | 79 | 80 | 80 | 91 | 90 | | | |
| 74- | COUAD2 | 80 | 80 | 81 | 81 | 92 | 91 | | | |
| 75- | COUAD2 | 81 | 81 | 82 | 82 | 93 | 92 | | | |
| 76- | COUAD2 | 82 | 82 | 83 | 83 | 94 | 93 | | | |
| 77- | COUAD2 | 83 | 83 | 84 | 84 | 95 | 94 | | | |
| 78- | COUAD2 | 84 | 84 | 85 | 85 | 96 | 95 | | | |
| 79- | COUAD2 | 85 | 85 | 86 | 86 | 97 | 96 | | | |
| 80- | COUAD2 | 86 | 86 | 87 | 87 | 98 | 97 | | | |
| 81- | COUAD2 | 87 | 87 | 88 | 88 | 99 | 98 | | | |
| 82- | COUAD2 | 88 | 88 | 89 | 89 | 100 | 99 | | | |
| 83- | COUAD2 | 90 | 90 | 91 | 91 | 102 | 101 | | | |
| 84- | COUAD2 | 91 | 91 | 92 | 92 | 103 | 102 | | | |
| 85- | COUAD2 | 92 | 92 | 93 | 93 | 104 | 103 | | | |
| 86- | COUAD2 | 93 | 93 | 94 | 94 | 105 | 104 | | | |
| 87- | COUAD2 | 94 | 94 | 95 | 95 | 106 | 105 | | | |
| 88- | COUAD2 | 95 | 95 | 96 | 96 | 107 | 106 | | | |
| 89- | COUAD2 | 96 | 96 | 97 | 97 | 108 | 107 | | | |
| 90- | COUAD2 | 97 | 97 | 98 | 98 | 109 | 108 | | | |
| 91- | COUAD2 | 98 | 98 | 99 | 99 | 110 | 109 | | | |
| 92- | COUAD2 | 99 | 99 | 100 | 100 | 111 | 110 | | | |
| 93- | COUAD2 | 101 | 101 | 102 | 102 | 113 | 112 | | | |
| 94- | COUAD2 | 102 | 102 | 103 | 103 | 114 | 113 | | | |
| 95- | COUAD2 | 103 | 103 | 104 | 104 | 115 | 114 | | | |
| 96- | COUAD2 | 104 | 104 | 105 | 105 | 116 | 115 | | | |
| 97- | COUAD2 | 105 | 105 | 106 | 106 | 117 | 116 | | | |
| 98- | COUAD2 | 106 | 106 | 107 | 107 | 118 | 117 | | | |
| 99- | COUAD2 | 107 | 107 | 108 | 108 | 119 | 118 | | | |
| 100- | COUAD2 | 108 | 108 | 109 | 109 | 120 | 119 | | | |

AXISYMMETRIC CIRC. CYL. WITH FLUID
 HARMONIC REDUCTION

APRIL 11, 1974 NASTRAN 5/13/72

SORTED BULK DATA ECHO

| CARD | COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------|--------|-----|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 101- | COUAD2 | 109 | 1 | 109 | 110 | 121 | 120 | 121 | 120 | 121 | 120 |
| 102- | COUAD2 | 110 | 1 | 110 | 111 | 122 | 121 | 122 | 121 | 122 | 121 |
| 103- | DMI | 0 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 |
| 104- | DMI | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 105- | *AMF | 1 | 1.03753539E-09 | 1.74902981E-09 | 1.74902981E-09 | 3.54101344E-02 | 3.54101344E-02 | 5.61138317E-02 | 5.61138317E-02 | 5.61138317E-02 | 5.61138317E-02 |
| 106- | *AMF | 2 | 3.99240818E-09 | 2.90458575E-02 | 2.90458575E-02 | -2.14204410E-09 | -2.14204410E-09 | 4.51854376E-09 | 4.51854376E-09 | 4.51854376E-09 | 4.51854376E-09 |
| 107- | *AMF | 3 | 2.67748497E-02 | -2.62538569E-09 | -2.62538569E-09 | 4.61171368E-09 | 4.61171368E-09 | 2.58644857E-02 | 2.58644857E-02 | 2.58644857E-02 | 2.58644857E-02 |
| 108- | *AMF | 4 | -2.88329072E-09 | 4.60591210E-09 | 4.60591210E-09 | 2.54706564E-02 | 2.54706564E-02 | -3.02422776E-09 | -3.02422776E-09 | -3.02422776E-09 | -3.02422776E-09 |
| 109- | *AMF | 5 | 4.58629046E-09 | 2.5292702E-02 | 2.5292702E-02 | -3.10135118E-09 | -3.10135118E-09 | 4.57119853E-09 | 4.57119853E-09 | 4.57119853E-09 | 4.57119853E-09 |
| 110- | *AMF | 6 | 2.52118781E-02 | -3.14255666E-09 | -3.14255666E-09 | 4.56220661E-09 | 4.56220661E-09 | 2.51769051E-02 | 2.51769051E-02 | 2.51769051E-02 | 2.51769051E-02 |
| 111- | *AMF | 7 | -3.16256843E-09 | 4.55771954E-09 | 4.55771954E-09 | 1.25835755E-02 | 1.25835755E-02 | -2.14254015E-09 | -2.14254015E-09 | -2.14254015E-09 | -2.14254015E-09 |
| 112- | *AMF | 8 | 2.37640809E-09 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| 113- | DMI | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 114- | *AMF | 10 | 2.26114988E-02 | 7.61923413E-10 | 7.61923413E-10 | -1.17619758E-09 | -1.17619758E-09 | 9.21048224E-03 | 9.21048224E-03 | 9.21048224E-03 | 9.21048224E-03 |
| 115- | *AMF | 11 | -1.17619758E-09 | -2.14204410E-09 | -2.14204410E-09 | 4.30269912E-03 | 4.30269912E-03 | -1.12416187E-09 | -1.12416187E-09 | -1.12416187E-09 | -1.12416187E-09 |
| 116- | *AMF | 12 | -2.62538569E-09 | 2.16825019E-03 | 2.16825019E-03 | -7.68552595E-10 | -7.68552595E-10 | -2.88329072E-09 | -2.88329072E-09 | -2.88329072E-09 | -2.88329072E-09 |
| 117- | *AMF | 13 | 1.13540888E-03 | -4.70962300E-10 | -4.70962300E-10 | -3.02422776E-09 | -3.02422776E-09 | 6.07476337E-04 | 6.07476337E-04 | 6.07476337E-04 | 6.07476337E-04 |
| 118- | *AMF | 14 | -2.75142797E-10 | -3.10135118E-09 | -3.10135118E-09 | 3.31870979E-04 | 3.31870979E-04 | -1.88317554E-10 | -1.88317554E-10 | -1.88317554E-10 | -1.88317554E-10 |
| 119- | *AMF | 15 | -3.14255666E-09 | 1.89498416E-04 | 1.89498416E-04 | -9.33349370E-11 | -9.33349370E-11 | -3.16256843E-09 | -3.16256843E-09 | -3.16256843E-09 | -3.16256843E-09 |
| 120- | *AMF | 16 | 1.21905570E-04 | -6.12229434E-11 | -6.12229434E-11 | -1.58183555E-09 | -1.58183555E-09 | 5.10035024E-05 | 5.10035024E-05 | 5.10035024E-05 | 5.10035024E-05 |
| 121- | *AMF | 17 | -2.39782222E-11 | 3 | 3 | 1 | 1 | 1 | 1 | 1 | 1 |
| 122- | DMI | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 123- | *AMF | 19 | 7.61923413E-10 | 1.83615163E-02 | 1.83615163E-02 | 3.99240818E-09 | 3.99240818E-09 | -1.17605836E-09 | -1.17605836E-09 | -1.17605836E-09 | -1.17605836E-09 |
| 124- | *AMF | 20 | 5.28116524E-03 | 4.51854376E-09 | 4.51854376E-09 | -1.12416187E-09 | -1.12416187E-09 | 1.61713664E-03 | 1.61713664E-03 | 1.61713664E-03 | 1.61713664E-03 |
| 125- | *AMF | 21 | 4.61171368E-09 | -7.68552595E-10 | -7.68552595E-10 | 5.16120810E-04 | 5.16120810E-04 | 4.60551210E-09 | 4.60551210E-09 | 4.60551210E-09 | 4.60551210E-09 |
| 126- | *AMF | 22 | -4.70962300E-10 | 1.68953789E-04 | 1.68953789E-04 | 4.58290466E-09 | 4.58290466E-09 | -2.75142797E-10 | -2.75142797E-10 | -2.75142797E-10 | -2.75142797E-10 |
| 127- | *AMF | 23 | 5.61394263E-05 | 4.57119853E-09 | 4.57119853E-09 | -1.58317554E-10 | -1.58317554E-10 | 1.88335543E-05 | 1.88335543E-05 | 1.88335543E-05 | 1.88335543E-05 |
| 128- | *AMF | 24 | 4.56220661E-09 | -9.33349370E-11 | -9.33349370E-11 | 6.41311362E-06 | 6.41311362E-06 | 4.55771954E-09 | 4.55771954E-09 | 4.55771954E-09 | 4.55771954E-09 |
| 129- | *AMF | 25 | -6.12229434E-11 | 2.38093708E-06 | 2.38093708E-06 | 2.27821051E-05 | 2.27821051E-05 | -2.58151139E-11 | -2.58151139E-11 | -2.58151139E-11 | -2.58151139E-11 |
| 130- | *AMF | 26 | 7.22207631E-07 | 4 | 4 | 1 | 1 | 1 | 1 | 1 | 1 |
| 131- | DMI | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 132- | *AMF | 28 | -1.17619758E-09 | 3.99240818E-09 | 3.99240818E-09 | 8.81596594E-02 | 8.81596594E-02 | -1.10450804E-09 | -1.10450804E-09 | -1.10450804E-09 | -1.10450804E-09 |
| 133- | *AMF | 29 | 6.26756957E-09 | 6.21049895E-02 | 6.21049895E-02 | -3.80158127E-09 | -3.80158127E-09 | 8.60412166E-05 | 8.60412166E-05 | 8.60412166E-05 | 8.60412166E-05 |
| 134- | *AMF | 30 | 5.49103394E-02 | -5.02533120E-09 | -5.02533120E-09 | 9.12445586E-09 | 9.12445586E-09 | 5.22455387E-02 | 5.22455387E-02 | 5.22455387E-02 | 5.22455387E-02 |
| 135- | *AMF | 31 | -5.64961056E-09 | 9.19800414E-09 | 9.19800414E-09 | 5.11574484E-02 | 5.11574484E-02 | -5.58463851E-09 | -5.58463851E-09 | -5.58463851E-09 | -5.58463851E-09 |
| 136- | *AMF | 32 | 9.17711418E-09 | 5.06425071E-02 | 5.06425071E-02 | -6.16678264E-05 | -6.16678264E-05 | 9.14249707E-05 | 9.14249707E-05 | 9.14249707E-05 | 9.14249707E-05 |
| 137- | *AMF | 33 | 5.04698716E-02 | -6.26391738E-09 | -6.26391738E-09 | 9.12892162E-09 | 9.12892162E-09 | 5.03750267E-02 | 5.03750267E-02 | 5.03750267E-02 | 5.03750267E-02 |
| 138- | *AMF | 34 | -6.31108312E-09 | 9.11859033E-09 | 9.11859033E-09 | 2.51765088E-02 | 2.51765088E-02 | -4.27954516E-09 | -4.27954516E-09 | -4.27954516E-09 | -4.27954516E-09 |
| 139- | *AMF | 35 | 4.74222261E-09 | 5 | 5 | 1 | 1 | 1 | 1 | 1 | 1 |
| 140- | DMI | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 141- | *AMF | 37 | 9.21048224E-03 | -1.17605836E-09 | -1.17605836E-09 | -1.10450804E-09 | -1.10450804E-09 | 2.569141980E-02 | 2.569141980E-02 | 2.569141980E-02 | 2.569141980E-02 |
| 142- | *AMF | 38 | -3.62237795E-10 | -3.80158127E-09 | -3.80158127E-09 | 1.13787390E-02 | 1.13787390E-02 | -1.94461114E-09 | -1.94461114E-09 | -1.94461114E-09 | -1.94461114E-09 |
| 143- | *AMF | 39 | -5.02533126E-09 | 5.43810800E-03 | 5.43810800E-03 | -1.59512425E-09 | -1.59512425E-09 | -5.64961056E-09 | -5.64961056E-09 | -5.64961056E-09 | -5.64961056E-09 |
| 144- | *AMF | 40 | 2.77573429E-03 | -1.04369580E-09 | -1.04369580E-09 | -5.98863856E-09 | -5.98863856E-09 | 1.46727962E-03 | 1.46727962E-03 | 1.46727962E-03 | 1.46727962E-03 |
| 145- | *AMF | 41 | -6.29279961E-10 | -6.16678264E-05 | -6.16678264E-05 | 7.96974637E-04 | 7.96974637E-04 | -3.68477653E-10 | -3.68477653E-10 | -3.68477653E-10 | -3.68477653E-10 |
| 146- | *AMF | 42 | -6.26391738E-09 | 4.53770447E-04 | 4.53770447E-04 | -2.19540483E-10 | -2.19540483E-10 | -6.21108321E-09 | -6.21108321E-09 | -6.21108321E-09 | -6.21108321E-09 |
| 147- | *AMF | 43 | 2.91505363E-04 | -1.44935050E-10 | -1.44935050E-10 | -3.15676263E-09 | -3.15676263E-09 | 1.21905570E-04 | 1.21905570E-04 | 1.21905570E-04 | 1.21905570E-04 |
| 148- | *AMF | 44 | -5.68604683E-11 | 6 | 6 | 1 | 1 | 1 | 1 | 1 | 1 |
| 149- | DMI | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 150- | *AMF | 46 | -1.17605836E-09 | 5.28116524E-03 | 5.28116524E-03 | 6.26756957E-09 | 6.26756957E-09 | -3.62237795E-10 | -3.62237795E-10 | -3.62237795E-10 | -3.62237795E-10 |

SORTED BULK DATA ECHO

| | | | | | | | | | | | |
|------|-------|----|-----------------|------------------|------------------|-----------------|------|----|---|---|----|
| CARD | COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 151- | *AMF | 47 | 1.99786499E-02 | 8.60412186E-09 | -1.94461114E-09 | 5.79728595E-03 | *AMF | 48 | | | |
| 152- | *AMF | 48 | 9.12445506E-09 | -1.59512425E-09 | 1.78609043E-03 | 9.19800414E-09 | *AMF | 49 | | | |
| 153- | *AMF | 49 | -1.04369580E-09 | 5.72260236E-04 | 9.17711418E-09 | -6.29279961E-10 | *AMF | 50 | | | |
| 154- | *AMF | 50 | 1.87787344E-04 | 9.14849707E-09 | -3.684477693E-10 | 6.25525427E-05 | *AMF | 51 | | | |
| 155- | *AMF | 51 | 9.12892102E-09 | -2.195400483E-10 | 2.12144951E-05 | 9.11859033E-09 | *AMF | 52 | | | |
| 156- | *AMF | 52 | -1.44935050E-10 | 7.85752854E-06 | 4.55777993E-09 | -6.12724038E-11 | *AMF | 53 | | | |
| 157- | *AMF | 53 | 2.38093617E-06 | | | | *AMF | 54 | | | |
| 158- | *MFLD | | | | | | | | | | |
| 159- | *AMF | 55 | -2.14204410E-09 | 4.51854376E-09 | 6.21849895E-02 | -3.80158127E-09 | *AMF | 56 | | | |
| 160- | *AMF | 56 | 8.60412186E-09 | 1.11024141E-01 | -3.98779676E-09 | 1.02734852E-08 | *AMF | 57 | | | |
| 161- | *AMF | 57 | 8.76550635E-02 | -6.82580747E-09 | 1.31904123E-08 | 8.02032948E-02 | *AMF | 58 | | | |
| 162- | *AMF | 58 | -8.12668333E-09 | 1.36956544E-08 | 7.74573684E-02 | -8.75216699E-09 | *AMF | 59 | | | |
| 163- | *AMF | 59 | 1.37602107E-08 | 7.63342977E-02 | -9.14720744E-09 | 1.27348337E-08 | *AMF | 60 | | | |
| 164- | *AMF | 60 | 7.58497119E-02 | -9.33530941E-09 | 1.37048080E-08 | 7.56467581E-02 | *AMF | 61 | | | |
| 165- | *AMF | 61 | -9.42648626E-09 | 1.36866412E-08 | 3.77954500E-02 | -6.40362785E-09 | *AMF | 62 | | | |
| 166- | *AMF | 62 | 7.11737158E-09 | | | | *AMF | 63 | | | |
| 167- | *MFLD | | | | | | | | | | |
| 168- | *AMF | 64 | 4.30269912E-03 | -1.12416187E-09 | -3.80158127E-09 | 1.13787350E-02 | *AMF | 65 | | | |
| 169- | *AMF | 65 | -1.94461114E-09 | -3.98779676E-09 | 2.80496068E-02 | -8.33200176E-10 | *AMF | 66 | | | |
| 170- | *AMF | 66 | -6.82580747E-09 | 1.19862184E-02 | -2.2197394E-05 | -8.12668333E-09 | *AMF | 67 | | | |
| 171- | *AMF | 67 | 5.76997921E-03 | -1.75344161E-09 | -8.79216699E-09 | 2.96523259E-03 | *AMF | 68 | | | |
| 172- | *AMF | 68 | -1.13703069E-09 | 9.14720744E-09 | 1.58918533E-03 | -6.90502766E-10 | *AMF | 69 | | | |
| 173- | *AMF | 69 | -9.33530941E-09 | 8.98981467E-04 | -4.26077750E-10 | -9.42648626E-09 | *AMF | 70 | | | |
| 174- | *AMF | 70 | 5.75681916E-04 | -2.80763413E-10 | -4.71536410E-09 | 2.40501904E-04 | *AMF | 71 | | | |
| 175- | *AMF | 71 | -1.10544240E-10 | | | | *AMF | 72 | | | |
| 176- | *MFLD | | | | | | | | | | |
| 177- | *AMF | 73 | -1.12416187E-09 | 1.61713664E-03 | 8.60412186E-05 | -1.94461114E-09 | *AMF | 74 | | | |
| 178- | *AMF | 74 | 5.79728595E-03 | 1.08734852E-08 | -8.23200176E-10 | 2.01476067E-02 | *AMF | 75 | | | |
| 179- | *AMF | 75 | 1.31904123E-08 | -2.2197394E-09 | 5.85342571E-03 | 1.26956544E-08 | *AMF | 76 | | | |
| 180- | *AMF | 76 | -1.75344161E-09 | 1.80492307E-03 | 1.37402107E-08 | -1.13703069E-09 | *AMF | 77 | | | |
| 181- | *AMF | 77 | 5.78677324E-04 | 1.37348337E-08 | -6.90502766E-10 | 1.90163270E-09 | *AMF | 78 | | | |
| 182- | *AMF | 78 | 1.37402107E-08 | 6.39099512E-05 | 1.26866412E-08 | 1.26866412E-08 | *AMF | 79 | | | |
| 183- | *AMF | 79 | -2.80763413E-10 | 2.35954350E-05 | 6.84057255E-09 | -1.19282903E-10 | *AMF | 80 | | | |
| 184- | *AMF | 80 | 7.13532063E-06 | | | | *AMF | 81 | | | |
| 185- | *MFLD | | | | | | | | | | |
| 186- | *AMF | 82 | -2.62538569E-09 | 4.61171368E-09 | 5.49103394E-02 | -5.02533126E-09 | *AMF | 83 | | | |
| 187- | *AMF | 83 | 9.12445506E-09 | 8.76556635E-02 | -6.82580747E-09 | 1.31904123E-08 | *AMF | 84 | | | |
| 188- | *AMF | 84 | 1.36317074E-01 | -7.08914527E-09 | 1.54446823E-08 | 1.12867534E-01 | *AMF | 85 | | | |
| 189- | *AMF | 85 | -9.96836391E-09 | 1.77526189E-08 | 1.05380177E-01 | -1.12892486E-08 | *AMF | 86 | | | |
| 190- | *AMF | 86 | 1.82537755E-08 | 1.02624536E-01 | -1.19606938E-08 | 1.82165945E-08 | *AMF | 87 | | | |
| 191- | *AMF | 87 | 1.01511240E-01 | -1.23097728E-08 | 1.82925532E-08 | 1.01061563E-01 | *AMF | 88 | | | |
| 192- | *AMF | 88 | -1.24778659E-08 | 1.82670874E-08 | 5.04698791E-02 | -8.50303254E-09 | *AMF | 89 | | | |
| 193- | *AMF | 89 | 9.49877332E-09 | | | | *AMF | 90 | | | |
| 194- | *MFLD | | | | | | | | | | |
| 195- | *AMF | 91 | 2.16825819E-03 | -7.68552999E-10 | -5.02533126E-09 | 5.43010800E-03 | *AMF | 92 | | | |
| 196- | *AMF | 92 | -1.59512425E-09 | -6.82580747E-09 | 1.19862184E-02 | -2.2197394E-09 | *AMF | 93 | | | |
| 197- | *AMF | 93 | -7.08914527E-09 | 2.83814743E-02 | -9.91517535E-10 | -5.56823635E-09 | *AMF | 94 | | | |
| 198- | *AMF | 94 | 1.21757135E-02 | -2.31308083E-09 | 1.12892486E-08 | 5.89188188E-03 | *AMF | 95 | | | |
| 199- | *AMF | 95 | -1.81486464E-09 | -1.19606938E-08 | 3.06723965E-02 | -1.18863075E-09 | *AMF | 96 | | | |
| 200- | *AMF | 96 | -1.23097728E-08 | 1.71109079E-03 | -7.51725753E-10 | -1.24778659E-08 | *AMF | 97 | | | |

SORTED BULK DATA ECHO

| CARD
COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------------|------|-----|-----------------|-----------------|-----------------|-----------------|------|-----|---|----|
| 201- | *AMF | 97 | 1.08848000E-03 | -5.13412646E-10 | -6.24230623E-09 | 4.53776447E-04 | *AMF | 98 | | |
| 202- | *AMF | 98 | -2.03331504E-10 | | | | *AMF | 99 | | |
| 203- | DMI | | *MFLD | 12 | 1 | | | | | |
| 204- | *AMF | 100 | -7.68552999E-10 | 5.16120810E-04 | 9.12445866E-09 | -1.59512425E-09 | *AMF | 101 | | |
| 205- | *AMF | 101 | 1.78609043E-03 | 1.31904123E-08 | -2.21975394E-09 | 5.85342571E-03 | *AMF | 102 | | |
| 206- | *AMF | 102 | 1.54446838E-08 | -9.91517535E-10 | 2.01664381E-02 | 1.77526145E-08 | *AMF | 103 | | |
| 207- | *AMF | 103 | -2.31308883E-09 | 5.85983694E-03 | 1.82533775E-02 | -1.81466464E-09 | *AMF | 104 | | |
| 208- | *AMF | 104 | 1.80730480E-03 | 1.83165945E-08 | -1.18863707E-09 | 5.80117805E-04 | *AMF | 105 | | |
| 209- | *AMF | 105 | 1.82925532E-08 | -7.51725793E-10 | 1.92549211E-04 | 1.82670874E-08 | *AMF | 106 | | |
| 210- | *AMF | 106 | -5.13412646E-10 | 7.04100676E-05 | 9.12943221E-09 | -2.19979725E-10 | *AMF | 107 | | |
| 211- | *AMF | 107 | 2.12144951E-05 | | | | *AMF | 108 | | |
| 212- | DMI | | *MFLD | 13 | 1 | | | | | |
| 213- | *AMF | 109 | -2.88329072E-09 | 4.60591210E-09 | 5.22455387E-02 | -5.64961056E-09 | *AMF | 110 | | |
| 214- | *AMF | 110 | 9.19800414E-09 | 8.02032948E-02 | -8.12668333E-09 | 1.36956544E-08 | *AMF | 111 | | |
| 215- | *AMF | 111 | 1.12867534E-01 | -9.96836391E-09 | 1.77526189E-08 | 1.61494017E-01 | *AMF | 112 | | |
| 216- | *AMF | 112 | -1.02517141E-08 | 2.00024033E-08 | 1.38034642E-01 | -1.31368907E-08 | *AMF | 113 | | |
| 217- | *AMF | 113 | 2.23090026E-08 | 1.30557060E-01 | -1.44518175E-08 | 2.28110970E-08 | *AMF | 114 | | |
| 218- | *AMF | 114 | 1.27836406E-01 | -1.51032502E-08 | 2.28789011E-08 | 1.26804173E-01 | *AMF | 115 | | |
| 219- | *AMF | 115 | -1.54111248E-08 | 2.28637553E-08 | 6.32660985E-02 | -1.05578724E-08 | *AMF | 116 | | |
| 220- | *AMF | 116 | 1.18903145E-08 | | | | *AMF | 117 | | |
| 221- | DMI | | *MFLD | 14 | 1 | | | | | |
| 222- | *AMF | 118 | 1.13540888E-03 | -4.70962380E-10 | -5.64961056E-09 | 2.77573425E-03 | *AMF | 119 | | |
| 223- | *AMF | 119 | -1.04369580E-09 | -8.12668333E-09 | 5.76997921E-03 | -1.75344161E-03 | *AMF | 120 | | |
| 224- | *AMF | 120 | -9.96836391E-09 | 1.21757165E-02 | -2.31308883E-09 | -1.02517141E-08 | *AMF | 121 | | |
| 225- | *AMF | 121 | 2.85033807E-02 | -1.05274056E-09 | -1.31368907E-08 | 1.22777224E-02 | *AMF | 122 | | |
| 226- | *AMF | 122 | -2.36468889E-09 | -1.44518175E-08 | 6.31378828E-03 | -1.87588745E-09 | *AMF | 123 | | |
| 227- | *AMF | 123 | -1.51032502E-08 | 3.25673795E-03 | -1.28196564E-09 | -1.54111248E-08 | *AMF | 124 | | |
| 228- | *AMF | 124 | 2.04296177E-03 | -9.10043152E-10 | -7.71066055E-09 | 8.47978052E-04 | *AMF | 125 | | |
| 229- | *AMF | 125 | -3.63987729E-10 | | | | *AMF | 126 | | |
| 230- | DMI | | *MFLD | 15 | 1 | | | | | |
| 231- | *AMF | 127 | -4.70962380E-10 | 1.68953789E-04 | 9.19800414E-09 | -1.04369580E-09 | *AMF | 128 | | |
| 232- | *AMF | 128 | 5.72260236E-04 | 1.36955544E-08 | -1.75344161E-09 | 1.80492387E-03 | *AMF | 129 | | |
| 233- | *AMF | 129 | 1.77526189E-08 | -2.31308883E-09 | 5.85983694E-03 | 2.0024033E-08 | *AMF | 130 | | |
| 234- | *AMF | 130 | -1.05274056E-09 | 2.01664381E-02 | 2.23790026E-08 | -2.36468889E-09 | *AMF | 131 | | |
| 235- | *AMF | 131 | 5.86128235E-03 | 2.28110970E-08 | -1.87588745E-09 | 1.80468673E-01 | *AMF | 132 | | |
| 236- | *AMF | 132 | 2.28789011E-08 | -1.28196564E-09 | 5.86530892E-04 | 2.28637553E-03 | *AMF | 133 | | |
| 237- | *AMF | 133 | -9.10043152E-10 | 2.11382750E-04 | 1.14282166E-08 | -3.95587119E-10 | *AMF | 134 | | |
| 238- | *AMF | 134 | 6.32747307E-05 | | | | *AMF | 135 | | |
| 239- | DMI | | *MFLD | 16 | 1 | | | | | |
| 240- | *AMF | 136 | -3.02422776E-09 | 4.58624046E-09 | 5.11574484E-02 | -5.58463856E-09 | *AMF | 137 | | |
| 241- | *AMF | 137 | 9.17711418E-09 | 7.74573684E-02 | -8.79216699E-09 | 1.37602107E-08 | *AMF | 138 | | |
| 242- | *AMF | 138 | 1.05380177E-01 | -1.12892436E-08 | 1.82533775E-08 | 1.38034642E-01 | *AMF | 139 | | |
| 243- | *AMF | 139 | -1.31368907E-08 | 2.23090026E-08 | 1.86670899E-01 | -1.24142830E-08 | *AMF | 140 | | |
| 244- | *AMF | 140 | 2.45601264E-08 | 1.63240572E-01 | -1.62794471E-08 | 2.68712053E-08 | *AMF | 141 | | |
| 245- | *AMF | 141 | 1.55850053E-01 | -1.75531696E-08 | 2.73229555E-08 | 1.53307080E-01 | *AMF | 142 | | |
| 246- | *AMF | 142 | -1.81274764E-08 | 2.74650415E-08 | 7.63343573E-02 | -1.25338104E-08 | *AMF | 143 | | |
| 247- | *AMF | 143 | 1.42942262E-08 | | | | *AMF | 144 | | |
| 248- | DMI | | *MFLD | 17 | 1 | | | | | |
| 249- | *AMF | 145 | 6.07476337E-04 | -2.75142797E-10 | -5.98463856E-09 | 1.46727962E-03 | *AMF | 146 | | |
| 250- | *AMF | 146 | -6.29279961E-10 | -8.79216699E-09 | 2.96522595E-03 | -1.13703069E-09 | *AMF | 147 | | |

AXISYMMETRIC CIRC. CYL. WITH FLUID
 HARMONIC REDUCTION

APRIL 11, 1974 NASTRAN 5/13/72

SORTED BULK DATA ECHO

| CARD
COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------------|----------|-----------------|-----------------|-----------------|-----------------|-----------------|----------|---|---|----|
| 251- | *AMF 147 | -1.12892486E-08 | 5.89188188E-03 | -1.81466464E-09 | -1.31368907E-08 | *AMF 148 | | | | |
| 252- | *AMF 148 | 1.22777224E-02 | -2.36468889E-09 | -1.34142830E-08 | 2.86252871E-02 | *AMF 149 | | | | |
| 253- | *AMF 149 | -1.11396337E-09 | -1.62794471E-08 | 1.24572204E-02 | -2.45802378E-09 | *AMF 150 | | | | |
| 254- | *AMF 150 | -1.75531696E-08 | 6.34565949E-03 | -2.03420503E-09 | -1.81274764E-08 | *AMF 151 | | | | |
| 255- | *AMF 151 | 3.86421406E-03 | -1.55710844E-09 | -9.07152042E-09 | 1.58918533E-03 | *AMF 152 | | | | |
| 256- | *AMF 152 | -6.33736841E-10 | | | | *AMF 153 | | | | |
| 257- | DMI | *MFLD | 18 | | 1 | 4.58629046E-09 | *AMF 154 | | | |
| 258- | *AMF 154 | -2.75142797E-10 | 5.61394263E-05 | 9.17711418E-09 | -6.29279961E-10 | *AMF 155 | | | | |
| 259- | *AMF 155 | 1.87737344E-04 | 1.37602107E-08 | -1.13703069E-09 | 5.78673324E-04 | *AMF 156 | | | | |
| 260- | *AMF 156 | 1.82533775E-08 | -1.81466464E-09 | 1.80730480E-03 | 2.23090026E-08 | *AMF 157 | | | | |
| 261- | *AMF 157 | -2.36468889E-09 | 5.86128235E-03 | 2.45601264E-08 | -1.11396337E-09 | *AMF 158 | | | | |
| 262- | *AMF 158 | 2.01712027E-02 | 2.68712093E-08 | -2.45802378E-09 | 5.66769357E-03 | *AMF 159 | | | | |
| 263- | *AMF 159 | 2.73822955E-08 | -2.03420503E-09 | 1.82851939E-03 | 2.74650915E-08 | *AMF 160 | | | | |
| 264- | *AMF 160 | -1.55710844E-09 | 6.42670036E-04 | 1.37394203E-08 | -6.94437174E-10 | *AMF 161 | | | | |
| 265- | *AMF 161 | 1.93168255E-04 | | | | *AMF 162 | | | | |
| 266- | DMI | *MFLD | 19 | | 1 | 2.52525702E-02 | *AMF 163 | | | |
| 267- | *AMF 163 | -3.10135118E-09 | 4.57119853E-05 | 5.06825671E-02 | -6.16678264E-09 | *AMF 164 | | | | |
| 268- | *AMF 164 | 9.14849707E-09 | 7.63342977E-02 | -9.14720744E-09 | 1.37348337E-08 | *AMF 165 | | | | |
| 269- | *AMF 165 | 1.02624536E-01 | -1.19606938E-08 | 1.83165945E-08 | 1.30557060E-01 | *AMF 166 | | | | |
| 270- | *AMF 166 | -1.44518175E-08 | 2.29110970E-08 | 1.63246572E-01 | -1.62794471E-08 | *AMF 167 | | | | |
| 271- | *AMF 167 | 2.68712093E-08 | 2.11963892E-01 | -1.65156315E-08 | 2.51313249E-08 | *AMF 168 | | | | |
| 272- | *AMF 168 | 1.89717246E-01 | -1.93036733E-08 | 3.14574997E-08 | 1.81714535E-01 | *AMF 169 | | | | |
| 273- | *AMF 169 | -2.04364596E-08 | 3.19882112E-08 | 9.00405818E-02 | -1.43711354E-08 | *AMF 170 | | | | |
| 274- | *AMF 170 | 1.66982410E-08 | | | | *AMF 171 | | | | |
| 275- | DMI | *MFLD | 20 | | 1 | -3.10135118E-09 | *AMF 172 | | | |
| 276- | *AMF 172 | 3.31870979E-04 | -1.58317554E-10 | -6.16678264E-09 | 7.56974637E-04 | *AMF 173 | | | | |
| 277- | *AMF 173 | -3.68477693E-10 | -9.14720744E-09 | 1.58918533E-03 | -6.90502766E-10 | *AMF 174 | | | | |
| 278- | *AMF 174 | -1.19606938E-08 | 3.06723965E-03 | -1.18863075E-09 | -1.44518175E-08 | *AMF 175 | | | | |
| 279- | *AMF 175 | 6.01378828E-03 | -1.87580745E-09 | -1.62794471E-08 | 1.24672204E-02 | *AMF 176 | | | | |
| 280- | *AMF 176 | -2.45802378E-09 | 1.65156315E-08 | 2.89571583E-02 | -1.27228055E-09 | *AMF 177 | | | | |
| 281- | *AMF 177 | -1.93036733E-08 | 1.30746961E-02 | -2.73316650E-09 | -2.04364596E-08 | *AMF 178 | | | | |
| 282- | *AMF 178 | 7.47108137E-03 | -2.50610741E-09 | -1.02327782E-08 | 3.01623624E-03 | *AMF 179 | | | | |
| 283- | *AMF 179 | -1.05509002E-09 | | | | *AMF 180 | | | | |
| 284- | DMI | *MFLD | 21 | | 1 | 4.57119853E-09 | *AMF 181 | | | |
| 285- | *AMF 181 | -1.58317554E-10 | 1.00336594E-05 | 9.14849707E-09 | -3.62077651E-10 | *AMF 182 | | | | |
| 286- | *AMF 182 | 6.25525427E-05 | 1.37340337E-08 | -6.90502766E-10 | 1.90168270E-04 | *AMF 183 | | | | |
| 287- | *AMF 183 | 1.83165945E-08 | -1.18863075E-09 | 5.80117895E-04 | 2.28110970E-03 | *AMF 184 | | | | |
| 288- | *AMF 184 | -1.87580745E-09 | 1.80960857E-03 | 2.68712093E-08 | -2.45802378E-09 | *AMF 185 | | | | |
| 289- | *AMF 185 | 5.86769357E-03 | 2.91313249E-08 | -1.27228055E-09 | 2.61900341E-02 | *AMF 186 | | | | |
| 290- | *AMF 186 | 3.14574997E-08 | -2.73316650E-09 | 5.92382370E-03 | 3.19882112E-08 | *AMF 187 | | | | |
| 291- | *AMF 187 | -2.50516741E-09 | 1.99747295E-03 | 1.605223754E-08 | -1.17801624E-05 | *AMF 188 | | | | |
| 292- | *AMF 188 | 5.79395331E-04 | | | | *AMF 189 | | | | |
| 293- | DMI | *MFLD | 22 | | 1 | 2.52118781E-02 | *AMF 190 | | | |
| 294- | *AMF 190 | -3.14255666E-09 | 4.56220661E-09 | 5.04698716E-02 | -6.26391738E-02 | *AMF 191 | | | | |
| 295- | *AMF 191 | 9.12892162E-09 | 7.58497119E-02 | -9.13530941E-09 | 1.37048908E-08 | *AMF 192 | | | | |
| 296- | *AMF 192 | 1.01511240E-01 | -1.23097728E-08 | 1.82925532E-08 | 1.27636406E-01 | *AMF 193 | | | | |
| 297- | *AMF 193 | -1.51032502E-08 | 2.28788014E-08 | 1.55850053E-01 | -1.75531656E-08 | *AMF 194 | | | | |
| 298- | *AMF 194 | 2.73822955E-08 | 1.80717246E-01 | -1.93036733E-08 | 3.14574997E-08 | *AMF 195 | | | | |
| 299- | *AMF 195 | 2.37828374E-01 | -1.93989210E-08 | 3.37373737E-08 | 3.15492070E-01 | *AMF 196 | | | | |
| 300- | *AMF 196 | -2.19290612E-08 | 3.60692134E-08 | 1.05380177E-01 | -1.55644848E-08 | *AMF 197 | | | | |

AXISYMMETRIC CIRC. CYL. WITH FLUID
HARMONIC REDUCTION

APRIL 11, 1974 NASTRAN 5/13/72

Volume II

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|----------|-----------------|-----------------|-----------------|-----------------|---|---|---|---|--------------------------|
| COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 301- | *AMF 197 | 1.90256237E-08 | | | | | | | | *AMF 198 |
| 302- | DMI | *MFLD | | | | | | | | |
| 303- | *AMF 199 | 1.87498416E-04 | -9.33349370E-11 | -6.26391738E-09 | | | | | | -3.14255666E-09 *AMF 199 |
| 304- | *AMF 200 | -2.19540483E-10 | -9.33530941E-09 | 8.98981467E-04 | -4.20077750E-10 | | | | | 4.53776447E-04 *AMF 200 |
| 305- | *AMF 201 | -1.23097728E-08 | 1.71109079E-03 | -7.51725753E-10 | -1.51032502E-08 | | | | | -1.51032502E-08 *AMF 201 |
| 306- | *AMF 202 | 3.25673795E-03 | -1.28196564E-09 | -1.75521696E-08 | 6.34565949E-03 | | | | | 6.34565949E-03 *AMF 202 |
| 307- | *AMF 203 | -2.03420503E-09 | -1.93036733E-08 | 1.20746961E-02 | -2.73316658E-09 | | | | | -2.73316658E-09 *AMF 203 |
| 308- | *AMF 204 | -1.93989216E-08 | 3.00925672E-02 | -1.74324311E-09 | -2.19290612E-08 | | | | | -2.19290612E-08 *AMF 204 |
| 309- | *AMF 205 | 1.52429529E-02 | 3.50171936E-09 | -1.10086411E-08 | 5.69188181E-03 | | | | | 5.69188181E-03 *AMF 205 |
| 310- | *AMF 206 | -1.60420499E-09 | | | | | | | | |
| 311- | DMI | *MFLD | | | | | | | | |
| 312- | *AMF 208 | -9.33349370E-11 | 6.41311302E-06 | 9.12892162E-09 | -2.19540483E-10 | | | | | 4.53776447E-04 *AMF 208 |
| 313- | *AMF 209 | 2.12144951E-05 | 1.37048808E-08 | -4.20077750E-10 | 6.35969512E-03 | | | | | 6.35969512E-03 *AMF 209 |
| 314- | *AMF 210 | 1.82925532E-08 | -7.51725753E-10 | 1.92549211E-04 | 2.28788011E-08 | | | | | 2.28788011E-08 *AMF 210 |
| 315- | *AMF 211 | -1.28196564E-09 | 5.86530892E-04 | 2.73829555E-08 | -2.03420503E-09 | | | | | -2.03420503E-09 *AMF 211 |
| 316- | *AMF 212 | 1.82851939E-03 | 3.14574997E-08 | -2.73316658E-09 | 5.69188181E-03 | | | | | 5.69188181E-03 *AMF 212 |
| 317- | *AMF 213 | 3.37372370E-08 | -1.74324311E-09 | 2.03585872E-02 | 3.67652134E-08 | | | | | 3.67652134E-08 *AMF 213 |
| 318- | *AMF 214 | -3.50171936E-09 | 6.43995404E-03 | 1.82969551E-08 | -1.65204955E-09 | | | | | -1.65204955E-09 *AMF 214 |
| 319- | *AMF 215 | 1.80730456E-03 | | | | | | | | |
| 320- | DMI | *MFLD | | | | | | | | |
| 321- | *AMF 217 | -3.16256843E-09 | 4.55771954E-09 | 5.03790267E-02 | -6.31108321E-03 | | | | | 2.51765051E-02 *AMF 217 |
| 322- | *AMF 218 | 9.11859033E-09 | 7.56467591E-02 | -9.42698626E-09 | 1.76866412E-08 | | | | | 1.76866412E-08 *AMF 218 |
| 323- | *AMF 219 | 1.01061583E-01 | -1.24778659E-08 | 1.82670874E-08 | 1.26804173E-01 | | | | | 1.26804173E-01 *AMF 219 |
| 324- | *AMF 220 | -1.54111240E-08 | 2.28637553E-08 | 1.53307980E-01 | -1.81274764E-08 | | | | | -1.81274764E-08 *AMF 220 |
| 325- | *AMF 221 | 2.74650915E-08 | 1.81714535E-01 | -2.04364596E-08 | 3.19882112E-08 | | | | | 3.19882112E-08 *AMF 221 |
| 326- | *AMF 222 | 2.15492070E-01 | -2.19290612E-08 | 3.60692134E-08 | 2.66874154E-01 | | | | | 2.66874154E-01 *AMF 222 |
| 327- | *AMF 223 | -2.15492070E-01 | 3.82557808E-08 | 1.25451088E-01 | -1.71183174E-08 | | | | | -1.71183174E-08 *AMF 223 |
| 328- | *AMF 224 | 2.09501430E-08 | | | | | | | | |
| 329- | DMI | *MFLD | | | | | | | | |
| 330- | *AMF 226 | 1.21925570E-04 | -6.12229434E-11 | -6.31108321E-09 | 2.91509363E-04 | | | | | -3.16256843E-09 *AMF 226 |
| 331- | *AMF 227 | -1.44935050E-10 | -9.42698626E-09 | 5.76591916E-04 | -2.80763413E-10 | | | | | 2.91509363E-04 *AMF 227 |
| 332- | *AMF 228 | -1.24778659E-08 | 1.08848000E-03 | -5.13412644E-10 | -1.54111248E-08 | | | | | -2.80763413E-10 *AMF 228 |
| 333- | *AMF 229 | 2.04296177E-03 | -9.10043152E-10 | -1.81274764E-08 | 3.66421406E-03 | | | | | -1.54111248E-08 *AMF 229 |
| 334- | *AMF 230 | -1.55710844E-09 | -2.04364596E-08 | 7.48116837E-03 | -2.10061674E-09 | | | | | 3.66421406E-03 *AMF 230 |
| 335- | *AMF 231 | -2.19290612E-08 | 1.52429529E-02 | -3.50171936E-09 | -2.15490663E-08 | | | | | -2.10061674E-09 *AMF 231 |
| 336- | *AMF 232 | 3.43952626E-02 | -2.86740498E-09 | -1.09703109E-08 | 1.22267154E-02 | | | | | -2.15490663E-08 *AMF 232 |
| 337- | *AMF 233 | -1.90214733E-09 | | | | | | | | 1.22267154E-02 *AMF 233 |
| 338- | DMI | *MFLD | | | | | | | | |
| 339- | *AMF 235 | -6.12229434E-11 | 2.38993708E-06 | 9.11859033E-09 | -1.44935050E-10 | | | | | 4.53776447E-04 *AMF 235 |
| 340- | *AMF 236 | 7.85752854E-06 | 1.36866412E-08 | -2.80763413E-10 | 2.35954358E-05 | | | | | -1.44935050E-10 *AMF 236 |
| 341- | *AMF 237 | 1.82670874E-08 | -5.13412644E-10 | 7.04107676E-05 | 2.28637553E-08 | | | | | 2.35954358E-05 *AMF 237 |
| 342- | *AMF 238 | -9.10043152E-10 | 2.73829555E-08 | -1.55710844E-09 | -1.55710844E-09 | | | | | -2.28637553E-08 *AMF 238 |
| 343- | *AMF 239 | 6.42670866E-04 | 3.19882112E-08 | -2.50516741E-05 | 1.59747955E-03 | | | | | -1.55710844E-09 *AMF 239 |
| 344- | *AMF 240 | 3.60692134E-08 | -3.50171936E-09 | 6.43995404E-03 | 3.82557808E-08 | | | | | 1.59747955E-03 *AMF 240 |
| 345- | *AMF 241 | -2.66740498E-09 | 2.19761249E-02 | 2.01721200E-02 | -2.46011589E-09 | | | | | -3.82557808E-08 *AMF 241 |
| 346- | *AMF 242 | 5.86055924E-03 | | | | | | | | 2.46011589E-09 *AMF 242 |
| 347- | DMI | *MFLD | | | | | | | | |
| 348- | *AMF 244 | -1.58183555E-09 | 2.27821051E-09 | 2.51769088E-02 | -3.15676263E-09 | | | | | 1.25835799E-02 *AMF 244 |
| 349- | *AMF 245 | 4.55777993E-09 | 3.77954580E-02 | -4.71536416E-09 | 6.84057255E-09 | | | | | -3.15676263E-09 *AMF 245 |
| 350- | *AMF 246 | 5.04698791E-02 | -6.24230623E-09 | 9.12942321E-05 | 6.72660985E-02 | | | | | 6.84057255E-09 *AMF 246 |

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OF POOR QUALITY

SORTED BULK DATA ECHO

| CARD | COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------|-------|-------|-----------------|-----------------|-----------------|-----------------|------|-----|----|----|----|
| 351- | *AMF | 247 | -7.71066055E-09 | 1.14282166E-08 | 7.63343573E-02 | -9.07152042E-09 | *AMF | 248 | | | |
| 352- | *AMF | 248 | 1.37394203E-08 | 9.00409818E-02 | -1.02327772E-08 | 1.60523754E-08 | *AMF | 249 | | | |
| 353- | *AMF | 249 | 1.05380177E-01 | -1.10086411E-08 | 1.82969551E-08 | 1.25451028E-01 | *AMF | 250 | | | |
| 354- | *AMF | 250 | -1.09703109E-08 | 2.01721200E-08 | 8.07470083E-02 | -8.02946687E-09 | *AMF | 251 | | | |
| 355- | *AMF | 251 | 1.08360823E-09 | | | | *AMF | 252 | | | |
| 356- | DMI | *MFLD | 29 | | | | | | | | |
| 357- | *AMF | 253 | 5.10035024E-05 | -2.58151139E-11 | -4.27954916E-09 | -2.14254015E-09 | *AMF | 253 | | | |
| 358- | *AMF | 254 | -6.12724038E-11 | -6.40362735E-09 | 2.40501904E-04 | -1.19282903E-10 | *AMF | 254 | | | |
| 359- | *AMF | 255 | -8.50303294E-09 | 4.53776447E-04 | -2.19975729E-10 | -1.05578728E-08 | *AMF | 255 | | | |
| 360- | *AMF | 256 | 8.47978052E-04 | -3.95587119E-10 | -1.25333810E-08 | 1.58918533E-03 | *AMF | 256 | | | |
| 361- | *AMF | 257 | -6.94437174E-10 | -1.43711354E-08 | 3.01623262E-03 | -1.17481624E-09 | *AMF | 257 | | | |
| 362- | *AMF | 258 | -1.59644848E-08 | 5.82188188E-03 | -1.85204985E-09 | -1.71183174E-08 | *AMF | 258 | | | |
| 363- | *AMF | 259 | 1.22267194E-02 | -2.46011589E-09 | -8.02946687E-09 | 1.42516978E-02 | *AMF | 259 | | | |
| 364- | *AMF | 260 | -2.25891930E-10 | | | | *AMF | 260 | | | |
| 365- | DMI | *MFLD | 30 | | | | | | | | |
| 366- | *AMF | 262 | -2.39782222E-11 | 7.22207631E-07 | 4.74222226E-09 | -5.68624663E-11 | *AMF | 262 | | | |
| 367- | *AMF | 263 | 2.38093617E-06 | 7.11737158E-09 | -1.10544240E-10 | 7.13532063E-06 | *AMF | 263 | | | |
| 368- | *AMF | 264 | 9.49877332E-09 | -2.03331504E-10 | 2.12144915E-05 | 1.18903145E-08 | *AMF | 264 | | | |
| 369- | *AMF | 265 | -3.63987729E-10 | 6.32747379E-05 | 1.42942262E-08 | -6.23730641E-10 | *AMF | 265 | | | |
| 370- | *AMF | 266 | 1.90168255E-04 | 1.66982410E-08 | -1.05509002E-09 | 5.79395331E-04 | *AMF | 266 | | | |
| 371- | *AMF | 267 | 1.90256237E-08 | -1.60420499E-09 | 1.80730456E-03 | 2.0501430E-08 | *AMF | 267 | | | |
| 372- | *AMF | 268 | -1.93214733E-09 | 5.86055964E-03 | 1.06360823E-08 | -2.25891930E-10 | *AMF | 268 | | | |
| 373- | *AMF | 269 | 1.00844130E-02 | | | | *AMF | 269 | | | |
| 374- | DMI | PDU2 | 0 | 2 | 1 | 2 | 30 | 30 | 30 | 30 | 0 |
| 375- | DMI | *PDU2 | 1 | | | | | | | | |
| 376- | *APD | 1 | 5.23188142E-08 | -5.44416601E-08 | 1.12713930E-01 | 2.13113509E-08 | *APD | 1 | | | |
| 377- | *APD | 2 | -1.56585855E-08 | 9.24558640E-02 | 9.05564875E-09 | -4.79478857E-09 | *APD | 2 | | | |
| 378- | *APD | 3 | 8.52270126E-02 | 5.01694686E-09 | -1.53029167E-09 | 8.23292126E-02 | *APD | 3 | | | |
| 379- | *APD | 4 | 2.62712541E-09 | -5.00945729E-10 | 8.10757279E-02 | 1.40558765E-09 | *APD | 4 | | | |
| 380- | *APD | 5 | -1.66452699E-10 | 8.05100203E-02 | 7.6787979E-10 | -5.28412760E-11 | *APD | 5 | | | |
| 381- | *APD | 6 | 8.02519321E-02 | 4.38464154E-10 | -1.90147897E-11 | 8.01489075E-02 | *APD | 6 | | | |
| 382- | *APD | 7 | 1.18201681E-10 | -7.19382798E-12 | 1.18104534E-03 | 2.12629195E-10 | *APD | 7 | | | |
| 383- | *APD | 8 | -4.28267144E-12 | | | | *APD | 8 | | | |
| 384- | DMI | *PDU2 | 2 | | | | | | | | |
| 385- | *APD | 10 | 1.44541204E-01 | 8.03613034E-08 | -1.43555928E-08 | 5.81768981E-02 | *APD | 10 | | | |
| 386- | *APD | 11 | 2.31136390E-08 | -1.17757706E-08 | 2.75014851E-02 | 7.07758825E-09 | *APD | 11 | | | |
| 387- | *APD | 12 | -1.08550644E-08 | 1.38603263E-02 | 2.25886332E-09 | -1.04059836E-09 | *APD | 12 | | | |
| 388- | *APD | 13 | 7.25796074E-03 | 7.39446060E-10 | -1.03263353E-08 | 3.88321863E-03 | *APD | 13 | | | |
| 389- | *APD | 14 | 2.45700793E-10 | -1.02542828E-08 | 2.12144526E-03 | 8.24273011E-11 | *APD | 14 | | | |
| 390- | *APD | 15 | -1.02214059E-08 | 1.21134543E-03 | 2.80677426E-11 | -1.62072271E-08 | *APD | 15 | | | |
| 391- | *APD | 16 | 7.79266469E-04 | 1.04204531E-11 | -1.02032729E-08 | 6.52067130E-04 | *APD | 16 | | | |
| 392- | *APD | 17 | 6.32165067E-12 | | | | *APD | 17 | | | |
| 393- | DMI | *PDU2 | 3 | | | | | | | | |
| 394- | *APD | 19 | -7.44992121E-08 | 1.18840098E-01 | 2.04092636E-08 | -3.03624242E-08 | *APD | 19 | | | |
| 395- | *APD | 20 | 3.41809653E-02 | 1.67410974E-08 | -1.41763188E-08 | 1.04664937E-02 | *APD | 20 | | | |
| 396- | *APD | 21 | 1.54321604E-08 | -7.14386772E-09 | 3.34045757E-03 | 1.49074530E-08 | *APD | 21 | | | |
| 397- | *APD | 22 | -3.74088671E-09 | 1.09350914E-03 | 1.46804879E-08 | -2.00148276E-09 | *APD | 22 | | | |
| 398- | *APD | 23 | 3.61147819E-04 | 1.45780525E-08 | -1.09343201E-09 | 1.21895346E-04 | *APD | 23 | | | |
| 399- | *APD | 24 | 1.45313130E-10 | -6.24349905E-10 | 4.15071901E-05 | 1.4511549E-08 | *APD | 24 | | | |
| 400- | *APD | 25 | -4.01648270E-08 | 1.54099835E-05 | 1.45055346E-08 | -3.36087380E-10 | *APD | 25 | | | |

AXISYMMETRIC CIRC. CYL. WITH FLUID
 HARMONIC REDUCTION

APRIL 11, 1974 NASTRAN 5/13/72

SORTED BULK DATA ECHO

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|------|----|------|
| COUNT | 26 | 9.34859872E-06 | | | | | | | | |
| 401- | *APD | | | | | | | | | *APD |
| 402- | DMI | | | | | | | | | |
| 403- | | | | | | | | | | |
| 404- | *APD | 28 | 2.13113509E-08 | -1.86585855E-08 | 2.71071792E-01 | 2.63282978E-08 | -1.71888779E-08 | *APD | 27 | |
| 405- | *APD | 29 | -5.92364486E-08 | 1.97941005E-01 | 2.63282978E-08 | -5.29573185E-09 | 1.66302741E-01 | *APD | 28 | |
| 406- | *APD | 30 | 1.74785078E-01 | 1.25827739E-08 | -5.29573185E-09 | 1.66302741E-01 | 3.29501316E-09 | *APD | 29 | |
| 407- | *APD | 31 | 6.42253184E-09 | -1.69674430E-09 | 1.62839234E-01 | 3.29501316E-09 | -1.85467489E-10 | *APD | 30 | |
| 408- | *APD | 32 | -5.56786839E-10 | 1.61327660E-01 | 1.84405158E-09 | -1.85467489E-10 | 1.60361469E-01 | *APD | 31 | |
| 409- | *APD | 33 | 1.60650611E-01 | 1.04995479E-09 | -6.29007124E-11 | 1.60361469E-01 | 5.64133629E-10 | *APD | 32 | |
| 410- | *APD | 34 | 6.74489333E-10 | -2.32974612E-11 | 1.60281181E-01 | 5.64133629E-10 | -1.43555866E-08 | *APD | 33 | |
| 411- | DMI | | | | | | | | | |
| 412- | *APD | 37 | 5.88768981E-02 | 2.31136390E-08 | -3.45254598E-08 | 1.72045708E-01 | 1.72045708E-01 | *APD | 34 | |
| 413- | *APD | 38 | 8.74309775E-08 | -2.52110510E-08 | 7.27372169E-02 | 2.5372505E-08 | 2.5372505E-08 | *APD | 35 | |
| 414- | *APD | 39 | -2.22617622E-08 | 3.47624458E-02 | 7.81703235E-09 | -2.11813962E-08 | -2.11813962E-08 | *APD | 36 | |
| 415- | *APD | 40 | 1.77435428E-02 | 2.50456411E-09 | -2.07402664E-08 | 9.27940553E-03 | 9.27940553E-03 | *APD | 37 | |
| 416- | *APD | 41 | 8.21873236E-10 | -2.05477377E-08 | 5.09456173E-03 | 2.73768341E-10 | 2.73768341E-10 | *APD | 38 | |
| 417- | *APD | 42 | -2.04615063E-08 | 2.90071149E-03 | 9.28477434E-11 | -2.04615063E-08 | -2.04615063E-08 | *APD | 39 | |
| 418- | *APD | 43 | 1.86341233E-03 | 3.43893941E-11 | -2.04144506E-08 | 1.55853271E-03 | 1.55853271E-03 | *APD | 40 | |
| 419- | *APD | 44 | 2.08408846E-11 | | | | | | | |
| 420- | DMI | | | | | | | | | |
| 421- | *APD | 46 | -3.03662429E-08 | 3.41809653E-02 | 4.90832974E-02 | -8.6755060E-08 | -8.6755060E-08 | *APD | 41 | |
| 422- | *APD | 47 | 1.29306614E-01 | 3.58414205E-08 | -3.74901106E-08 | 3.75214219E-02 | 3.75214219E-02 | *APD | 42 | |
| 423- | *APD | 48 | 3.16445469E-08 | -1.79172055E-08 | 1.15600042E-02 | 3.01126448E-08 | 3.01126448E-08 | *APD | 43 | |
| 424- | *APD | 49 | -9.14534937E-09 | 3.70380539E-03 | 2.94855056E-02 | 4.83431961E-09 | 4.83431961E-09 | *APD | 44 | |
| 425- | *APD | 50 | 1.21540460E-03 | 2.92117974E-08 | -2.62853244E-05 | 4.04855004E-04 | 4.04855004E-04 | *APD | 45 | |
| 426- | *APD | 51 | 2.90892075E-08 | -1.99508028E-09 | 1.37305324E-04 | 2.50368476E-08 | 2.50368476E-08 | *APD | 46 | |
| 427- | *APD | 52 | -9.60437285E-10 | 5.38558005E-05 | 2.90223099E-08 | -8.03296540E-10 | -8.03296540E-10 | *APD | 47 | |
| 428- | *APD | 53 | 3.08199669E-05 | | | | | | | |
| 429- | DMI | | | | | | | | | |
| 430- | *APD | 55 | 9.95564875E-09 | -4.79478857E-09 | 1.97941005E-01 | 2.63282978E-08 | 2.63282978E-08 | *APD | 48 | |
| 431- | *APD | 56 | -1.71888779E-08 | 3.53401005E-01 | 6.49015419E-08 | -5.97373742E-08 | -5.97373742E-08 | *APD | 49 | |
| 432- | *APD | 57 | 2.79016793E-01 | 2.77338827E-08 | -1.73853296E-08 | 2.5295058E-01 | 2.5295058E-01 | *APD | 50 | |
| 433- | *APD | 58 | 1.33506610E-08 | -5.35157341E-09 | 2.46554673E-01 | 6.6609710E-09 | 6.6609710E-09 | *APD | 51 | |
| 434- | *APD | 59 | -1.71575909E-09 | 2.42379425E-01 | 3.67707557E-09 | -5.63040303E-10 | -5.63040303E-10 | *APD | 52 | |
| 435- | *APD | 60 | 2.41437197E-01 | 2.08007679E-09 | -1.89750160E-10 | 2.40791242E-01 | 2.40791242E-01 | *APD | 53 | |
| 436- | *APD | 61 | 1.33202160E-09 | -6.99601627E-11 | 2.40613401E-01 | 1.11255329E-09 | 1.11255329E-09 | *APD | 54 | |
| 437- | *APD | 62 | -4.23122509E-11 | | | | | | | |
| 438- | DMI | | | | | | | | | |
| 439- | *APD | 64 | 2.75044851E-02 | 7.07758829E-09 | -2.52110510E-02 | 7.27372169E-02 | 7.27372169E-02 | *APD | 55 | |
| 440- | *APD | 65 | 2.53725005E-08 | -4.50114399E-08 | 1.79303646E-01 | 8.81703535E-08 | 8.81703535E-08 | *APD | 56 | |
| 441- | *APD | 66 | -3.55373828E-08 | 7.66204300E-02 | 2.56192027E-02 | -3.25160414E-08 | -3.25160414E-08 | *APD | 57 | |
| 442- | *APD | 67 | 3.68838906E-02 | 7.89453086E-09 | -3.14028021E-09 | 1.8954888E-02 | 1.8954888E-02 | *APD | 58 | |
| 443- | *APD | 68 | 2.53263188E-09 | -3.09474899E-08 | 1.01586729E-02 | 8.32293567E-10 | 8.32293567E-10 | *APD | 59 | |
| 444- | *APD | 69 | -3.07510106E-08 | 5.74662909E-03 | 2.80090173E-10 | -3.06687258E-08 | -3.06687258E-08 | *APD | 60 | |
| 445- | *APD | 70 | 3.67997750E-03 | 1.03268186E-10 | -3.06460812E-08 | 3.07475729E-03 | 3.07475729E-03 | *APD | 61 | |
| 446- | *APD | 71 | 6.24571089E-11 | | | | | | | |
| 447- | DMI | | | | | | | | | |
| 448- | *APD | 73 | -1.41763188E-08 | 1.04664937E-02 | 3.58414205E-08 | -3.74901106E-08 | -3.74901106E-08 | *APD | 62 | |
| 449- | *APD | 74 | 3.75214219E-02 | 6.39907398E-08 | -9.24164283E-02 | 1.20400121E-01 | 1.20400121E-01 | *APD | 63 | |
| 450- | *APD | 75 | 5.05219049E-08 | -3.94915922E-08 | 3.78847681E-02 | 4.62265954E-08 | 4.62265954E-08 | *APD | 64 | |

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AXISYMMETRIC CIRC. CYL. WITH FLUID
HARMONIC REDUCTION

SORTED BULK DATA ECHO

| CARD
COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------------|----------|-----------------|-----------------|-----------------|-----------------|----------|---|---|---|----|
| 451- | *APD 76 | -1.90106384E-08 | 1.16818994E-02 | 4.46439535E-08 | -9.76969972E-09 | *APD 77 | | | | |
| 452- | *APD 77 | 3.74531257E-03 | 4.39966570E-08 | -5.23596810E-09 | 1.23081449E-03 | *APD 78 | | | | |
| 453- | *APD 78 | 4.37173320E-08 | -2.96191982E-09 | 4.14203620E-04 | 4.36003589E-08 | *APD 79 | | | | |
| 454- | *APD 79 | -1.89672855E-09 | 1.52715307E-04 | 4.35691571E-08 | -1.58478657E-09 | *APD 80 | | | | |
| 455- | *APD 80 | 9.23629705E-05 | | | | *APD 81 | | | | |
| 456- | DMI | *PDU2 | 10 | | | | | | | |
| 457- | *APD 82 | 5.01694686E-09 | -1.53029167E-09 | 1.74785078E-01 | 1.25027739E-08 | *APD 83 | | | | |
| 458- | *APD 83 | -5.29573185E-09 | 2.79016793E-01 | 2.7733827E-08 | -1.73553296E-08 | *APD 84 | | | | |
| 459- | *APD 84 | 4.33911026E-01 | 6.56694397E-08 | -5.97931944E-08 | 3.59268665E-01 | *APD 85 | | | | |
| 460- | *APD 85 | 2.81723480E-08 | -1.73743437E-08 | 3.35435688E-01 | 1.36327287E-08 | *APD 86 | | | | |
| 461- | *APD 86 | -5.35863265E-09 | 3.26664209E-01 | 7.09702164E-09 | -1.72004166E-09 | *APD 87 | | | | |
| 462- | *APD 87 | 3.23120475E-01 | 3.95914412E-09 | -5.70905767E-10 | 3.21689129E-01 | *APD 88 | | | | |
| 463- | *APD 88 | 2.51854071E-09 | -2.08764936E-10 | 3.21301281E-01 | 2.09950914E-09 | *APD 89 | | | | |
| 464- | *APD 89 | -1.25801397E-10 | | | | *APD 90 | | | | |
| 465- | DMI | *PDU2 | 11 | | | | | | | |
| 466- | *APD 91 | 1.38603263E-02 | 2.25886332E-09 | -2.22617622E-08 | 3.47628458E-02 | *APD 92 | | | | |
| 467- | *APD 92 | 7.81703235E-09 | -3.55373828E-08 | 7.66204000E-02 | 2.56182027E-08 | *APD 93 | | | | |
| 468- | *APD 93 | -5.52657227E-08 | 1.81425095E-01 | 8.82607765E-08 | -4.57587858E-08 | *APD 94 | | | | |
| 469- | *APD 94 | 7.78317451E-02 | 2.56462691E-08 | -4.27232649E-08 | 3.76631543E-02 | *APD 95 | | | | |
| 470- | *APD 95 | 7.90987817E-09 | -4.16060715E-08 | 1.96069553E-02 | 2.53895349E-09 | *APD 96 | | | | |
| 471- | *APD 96 | -4.11547134E-08 | 1.09379366E-02 | 8.42714121E-10 | -4.09724130E-08 | *APD 97 | | | | |
| 472- | *APD 97 | 6.95797428E-03 | 3.08157722E-10 | -4.09230125E-08 | 5.80142066E-03 | *APD 98 | | | | |
| 473- | *APD 98 | 1.85695431E-10 | | | | *APD 99 | | | | |
| 474- | DMI | *PDU2 | 12 | | | | | | | |
| 475- | *APD 100 | -7.14386772E-09 | 3.34045757E-03 | 3.16485469E-08 | 1.54221604E-08 | *APD 101 | | | | |
| 476- | *APD 101 | 1.15600042E-02 | -5.05219049E-08 | -3.94915922E-08 | 3.78847681E-02 | *APD 102 | | | | |
| 477- | *APD 102 | 7.85687462E-08 | 9.35098683E-08 | 1.30522013E-01 | 6.5053202E-08 | *APD 103 | | | | |
| 478- | *APD 103 | -4.01159426E-08 | 3.79262753E-02 | 6.07377046E-08 | -1.94122869E-08 | *APD 104 | | | | |
| 479- | *APD 104 | 1.16973072E-02 | 5.91494889E-08 | -1.01057865E-08 | 3.75466119E-03 | *APD 105 | | | | |
| 480- | *APD 105 | 5.85078119E-08 | -5.63761660E-09 | 1.24622439E-03 | 5.82486415E-08 | *APD 106 | | | | |
| 481- | *APD 106 | -3.58626950E-09 | 4.55710804E-04 | 5.81784114E-08 | -2.59016034E-09 | *APD 107 | | | | |
| 482- | *APD 107 | 2.74610473E-04 | | | | *APD 108 | | | | |
| 483- | DMI | *PDU2 | 13 | | | | | | | |
| 484- | *APD 109 | 2.62712641E-09 | -5.00943729E-10 | 1.66302741E-01 | 6.42253184E-09 | *APD 110 | | | | |
| 485- | *APD 110 | -1.69674430E-09 | 2.55295090E-01 | 1.33506610E-08 | -5.35157341E-09 | *APD 111 | | | | |
| 486- | *APD 111 | 3.59268665E-01 | 2.81723480E-08 | -1.73743437E-08 | 5.14051616E-01 | *APD 112 | | | | |
| 487- | *APD 112 | 6.59514967E-08 | -5.98002430E-08 | 4.39378262E-01 | 2.84083725E-08 | *APD 113 | | | | |
| 488- | *APD 113 | -1.73786283E-08 | 4.15576279E-01 | 1.39147929E-08 | -5.36569189E-09 | *APD 114 | | | | |
| 489- | *APD 114 | 4.06916142E-01 | 7.53548690E-09 | -1.73905645E-09 | 4.03630455E-01 | *APD 115 | | | | |
| 490- | *APD 115 | 4.72703121E-09 | -6.26747099E-10 | 4.02764916E-01 | 3.52412502E-09 | *APD 116 | | | | |
| 491- | *APD 116 | -3.75217413E-10 | | | | *APD 117 | | | | |
| 492- | DMI | *PDU2 | 14 | | | | | | | |
| 493- | *APD 118 | 7.25796074E-03 | 7.39446060E-10 | -2.11813962E-08 | 1.77435428E-02 | *APD 119 | | | | |
| 494- | *APD 119 | 2.50456411E-09 | -3.25160414E-08 | 3.68389006E-02 | 7.69945866E-09 | *APD 120 | | | | |
| 495- | *APD 120 | -4.57587888E-08 | 7.78317451E-02 | 2.56462691E-08 | -6.54729320E-08 | *APD 121 | | | | |
| 496- | *APD 121 | 1.82204366E-01 | 8.82711788E-08 | -5.59620581E-08 | 7.84838200E-02 | *APD 122 | | | | |
| 497- | *APD 122 | -2.55525929E-08 | -5.29304920E-08 | 3.84424217E-02 | 7.52029909E-09 | *APD 123 | | | | |
| 498- | *APD 123 | -5.18274774E-08 | 2.08182968E-02 | 2.56702126E-09 | -5.14089962E-08 | *APD 124 | | | | |
| 499- | *APD 124 | 1.30593814E-02 | 9.25141297E-10 | -5.12987448E-08 | 1.08411908E-02 | *APD 125 | | | | |
| 500- | *APD 125 | 5.53958515E-10 | | | | | | | | |

AXISYMMETRIC CIRC. CYL. WITH FLUID
 HARMONIC REDUCTION

APRIL 11, 1974 NASTRAN 5/13/72

SORTED BULK DATA ECHO

| CARD | COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------|----------|------------------|------------------|------------------|-----------------|----------------|---|---|---|---|----------|
| 501- | DMI | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 502- | *PDU2 | 15 | | | | | | | | | |
| 503- | *APD 127 | -3.7408671E-09 | 1.09350914E-03 | 3.0112644E-08 | -9.14534937E-09 | 1.49074530E-08 | | | | | *APD 127 |
| 504- | *APD 128 | 3.70380539E-03 | 4.62265994E-08 | -1.901006384E-08 | -1.6818994E-02 | 9.30799047E-08 | | | | | *APD 128 |
| 505- | *APD 129 | 6.50532002E-08 | -4.01159426E-08 | 3.79262753E-02 | 9.30799047E-08 | 9.30799047E-08 | | | | | *APD 129 |
| 506- | *APD 130 | -9.39114670E-08 | 1.30537391E-01 | 7.95587312E-08 | -4.04520293E-08 | 9.30799047E-08 | | | | | *APD 130 |
| 507- | *APD 131 | 3.79356258E-02 | 7.52486631E-08 | -1.991393354E-08 | 1.17127188E-02 | 9.30799047E-08 | | | | | *APD 131 |
| 508- | *APD 132 | 3.736807806E-08 | -1.07301368E-08 | 3.79616814E-03 | 7.30858574E-08 | 9.30799047E-08 | | | | | *APD 132 |
| 509- | *APD 133 | -6.73184594E-09 | 1.36811961E-03 | 7.29290822E-08 | -5.58775071E-09 | 9.30799047E-08 | | | | | *APD 133 |
| 510- | *APD 134 | 8.19058390E-04 | | | | | | | | | *APD 134 |
| 511- | DMI | 16 | | | | | | | | | |
| 512- | *PDU2 | 1 | | | | | | | | | |
| 513- | *APD 136 | 1.40558765E-09 | -1.66452699E-10 | 1.62839234E-01 | 3.39501316E-09 | 9.30799047E-08 | | | | | *APD 136 |
| 514- | *APD 137 | -5.56786839E-10 | 2.46554673E-01 | 6.86099710E-09 | -1.71575905E-09 | 9.30799047E-08 | | | | | *APD 137 |
| 515- | *APD 138 | 3.35435688E-01 | 1.36327207E-08 | -5.35663265E-09 | 4.39378242E-01 | 9.30799047E-08 | | | | | *APD 138 |
| 516- | *APD 139 | 2.84083725E-08 | -1.737866203E-08 | 5.94192207E-01 | 6.62335536E-08 | 9.30799047E-08 | | | | | *APD 139 |
| 517- | *APD 140 | -5.948073484E-08 | 5.19630134E-01 | 2.88468378E-08 | -1.73976424E-08 | 9.30799047E-08 | | | | | *APD 140 |
| 518- | *APD 141 | 4.96086359E-01 | 1.46826835E-08 | -5.42157344E-09 | 4.87951869E-01 | 9.30799047E-08 | | | | | *APD 141 |
| 519- | *APD 142 | 8.94107188E-09 | -1.90550908E-09 | 4.85959709E-01 | 7.35415639E-09 | 9.30799047E-08 | | | | | *APD 142 |
| 520- | *APD 143 | -1.12769238E-09 | | | | | | | | | *APD 143 |
| 521- | DMI | 17 | | | | | | | | | |
| 522- | *PDU2 | 1 | | | | | | | | | |
| 523- | *APD 145 | 3.88321863E-03 | 2.45700793E-10 | -2.07402664E-08 | 9.37940553E-03 | 9.30799047E-08 | | | | | *APD 145 |
| 524- | *APD 146 | 8.21873236E-10 | -3.14028021E-08 | 1.89548800E-02 | 2.53263188E-09 | 9.30799047E-08 | | | | | *APD 146 |
| 525- | *APD 147 | -4.27232649E-08 | 3.76631543E-02 | 7.90587897E-09 | -5.5962051E-08 | 9.30799047E-08 | | | | | *APD 147 |
| 526- | *APD 148 | 7.84838200E-02 | 2.56525929E-08 | -7.56801342E-08 | 1.82983637E-01 | 9.30799047E-08 | | | | | *APD 148 |
| 527- | *APD 149 | 8.82815812E-08 | -6.61834179E-08 | 7.96951652E-02 | 2.56806554E-08 | 9.30799047E-08 | | | | | *APD 149 |
| 528- | *APD 150 | -6.31847570E-08 | 4.05633865E-02 | 8.09272915E-09 | -6.21537875E-08 | 9.30799047E-08 | | | | | *APD 150 |
| 529- | *APD 151 | 2.47015134E-02 | 2.81272183E-09 | -6.18949230E-08 | 2.03173421E-02 | 9.30799047E-08 | | | | | *APD 151 |
| 530- | *APD 152 | 1.66458691E-09 | | | | | | | | | *APD 152 |
| 531- | DMI | 18 | | | | | | | | | |
| 532- | *PDU2 | 1 | | | | | | | | | |
| 533- | *APD 154 | -2.00148276E-09 | 3.63347819E-04 | 2.94855056E-08 | -4.83431961E-09 | 9.30799047E-08 | | | | | *APD 154 |
| 534- | *APD 155 | 1.21540460E-03 | 4.46439543E-08 | -9.76969972E-09 | 3.74531257E-03 | 9.30799047E-08 | | | | | *APD 155 |
| 535- | *APD 156 | 6.07377046E-08 | -1.94122869E-08 | 1.16973072E-02 | 7.95587312E-08 | 9.30799047E-08 | | | | | *APD 156 |
| 536- | *APD 157 | -4.04520293E-08 | 3.79356258E-02 | 1.07591063E-07 | -9.4312122E-08 | 9.30799047E-08 | | | | | *APD 157 |
| 537- | *APD 158 | 1.30552820E-01 | 9.40903122E-08 | -4.10763746E-08 | 3.79771329E-02 | 9.30799047E-08 | | | | | *APD 158 |
| 538- | *APD 159 | 8.98269263E-08 | -2.09773683E-08 | 1.18346140E-02 | 8.83612750E-08 | 9.30799047E-08 | | | | | *APD 159 |
| 539- | *APD 160 | -1.27316184E-08 | 4.15951386E-03 | 8.79932713E-08 | -1.04719327E-08 | 9.30799047E-08 | | | | | *APD 160 |
| 540- | *APD 161 | 2.46162829E-03 | | | | | | | | | *APD 161 |
| 541- | DMI | 19 | | | | | | | | | |
| 542- | *PDU2 | 1 | | | | | | | | | |
| 543- | *APD 163 | 7.67867975E-10 | -5.58412760E-11 | 1.61327660E-01 | 1.84405158E-09 | 9.30799047E-08 | | | | | *APD 163 |
| 544- | *APD 164 | -1.85467489E-10 | 2.42979825E-01 | 3.67707997E-09 | -5.63846303E-10 | 9.30799047E-08 | | | | | *APD 164 |
| 545- | *APD 165 | 3.26664209E-01 | 7.09702164E-09 | -1.72004166E-09 | 4.15576275E-01 | 9.30799047E-08 | | | | | *APD 165 |
| 546- | *APD 166 | 1.39147929E-08 | -5.36568189E-09 | 5.19030134E-01 | 2.88468378E-08 | 9.30799047E-08 | | | | | *APD 166 |
| 547- | *APD 167 | -1.73976424E-08 | 6.74702287E-01 | 6.70014514E-08 | -5.5863168E-08 | 9.30799047E-08 | | | | | *APD 167 |
| 548- | *APD 168 | 6.03705922E-01 | 3.02524228E-08 | -1.75640942E-08 | 5.78415573E-01 | 9.30799047E-08 | | | | | *APD 168 |
| 549- | *APD 169 | 1.73098051E-08 | -5.97248028E-09 | 5.73210282E-01 | 1.39556017E-08 | 9.30799047E-08 | | | | | *APD 169 |
| 550- | *APD 170 | -3.43579964E-09 | | | | | | | | | *APD 170 |
| 551- | DMI | 20 | | | | | | | | | |
| 552- | *PDU2 | 1 | | | | | | | | | |
| 553- | *APD 172 | 2.12144526E-03 | 8.24273011E-11 | -2.05477377E-08 | 5.09456173E-03 | 9.30799047E-08 | | | | | *APD 172 |
| 554- | *APD 173 | 2.73768341E-10 | -3.09474899E-08 | 1.01586729E-02 | 8.32293567E-10 | 9.30799047E-08 | | | | | *APD 173 |
| 555- | *APD 174 | -4.16060715E-08 | 1.96069553E-02 | 2.53895349E-05 | -5.2934920E-08 | 9.30799047E-08 | | | | | *APD 174 |
| 556- | *APD 175 | 3.84424217E-02 | 7.92029908E-09 | -6.61834179E-08 | 7.96951652E-02 | 9.30799047E-08 | | | | | *APD 175 |

 ORIGINAL PAGE IS
 OF POOR QUALITY

SO R T E D B U L K D A T A E C H O

| CARD | COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------|-------|----------|-----------------|------------------|-----------------|-----------------|----------|---|---|---|----|
| 551- | | *APD 176 | 2.56806594E-08 | -8.59344027E-08 | 1.85105085E-01 | 8.83640041E-08 | *APD 177 | | | | |
| 552- | | *APD 177 | -7.65097639E-08 | 8.35784078E-02 | 2.59263579E-02 | -7.36707153E-08 | *APD 178 | | | | |
| 553- | | *APD 178 | 4.78218235E-02 | 8.74217321E-09 | -7.30082345E-06 | 3.85618359E-02 | *APD 179 | | | | |
| 554- | | *APD 179 | 5.07158049E-09 | | | | *APD 180 | | | | |
| 555- | | DMI | *PDU2 | 21 | | | | | | | |
| 556- | | *APD 181 | -1.09343201E-09 | 1.21895340E-04 | 2.92117974E-08 | -2.62583244E-09 | *APD 182 | | | | |
| 557- | | *APD 182 | 4.04855004E-04 | 4.39966570E-08 | -5.23596810E-09 | 1.23081449E-03 | *APD 183 | | | | |
| 558- | | *APD 183 | 5.91494889E-08 | -1.01057864E-08 | 3.47546611E-03 | 7.52488631E-08 | *APD 184 | | | | |
| 559- | | *APD 184 | -1.98139354E-08 | 1.17127188E-02 | 9.46900122E-08 | -4.10763756E-08 | *APD 185 | | | | |
| 560- | | *APD 185 | 3.79771329E-02 | 1.22169126E-07 | -9.54065627E-08 | 1.36674720E-01 | *APD 186 | | | | |
| 561- | | *APD 186 | 1.08770507E-07 | -4.39778613E-08 | 3.83404791E-02 | 1.64734397E-07 | *APD 187 | | | | |
| 562- | | *APD 187 | -2.46482550E-08 | 1.29281208E-02 | 1.03793411E-07 | -1.58754826E-08 | *APD 188 | | | | |
| 563- | | *APD 188 | 7.49997050E-03 | | | | *APD 189 | | | | |
| 564- | | DMI | *PDU2 | 22 | | | | | | | |
| 565- | | *APD 190 | 4.38464154E-10 | -1.90147897E-11 | 1.60650611E-01 | 8.02519321E-02 | *APD 190 | | | | |
| 566- | | *APD 191 | -6.29007124E-11 | 2.41437197E-01 | 2.08007678E-09 | -1.64995475E-09 | *APD 191 | | | | |
| 567- | | *APD 192 | 3.23120475E-01 | 3.95914412E-09 | -5.77905767E-10 | 4.06916142E-01 | *APD 193 | | | | |
| 568- | | *APD 193 | 7.53548690E-09 | -1.73905645E-09 | 4.96086359E-01 | 1.46826835E-08 | *APD 194 | | | | |
| 569- | | *APD 194 | -5.42153344E-09 | 6.00705922E-01 | 3.02524228E-08 | -1.75640042E-08 | *APD 195 | | | | |
| 570- | | *APD 195 | 7.57031500E-01 | 6.96285838E-08 | -5.03641297E-08 | 6.85932934E-01 | *APD 196 | | | | |
| 571- | | *APD 196 | 3.52693690E-08 | -1.90943830E-08 | 6.70871437E-01 | 2.72654503E-08 | *APD 197 | | | | |
| 572- | | *APD 197 | -1.07172653E-08 | | | | *APD 198 | | | | |
| 573- | | DMI | *PDU2 | 23 | | | | | | | |
| 574- | | *APD 199 | 1.21134543E-03 | 2.80677426E-11 | -2.04615063E-08 | -1.02214055E-08 | *APD 199 | | | | |
| 575- | | *APD 200 | 9.28477434E-11 | 3.07510106E-08 | 5.74662905E-03 | 2.90071145E-03 | *APD 200 | | | | |
| 576- | | *APD 201 | -4.11547134E-08 | 1.09379366E-02 | 8.42714121E-10 | -5.18274774E-08 | *APD 202 | | | | |
| 577- | | *APD 202 | 2.01162906E-02 | 2.56702126E-09 | -6.31047670E-08 | 4.05630666E-02 | *APD 203 | | | | |
| 578- | | *APD 203 | 8.00272915E-09 | -7.65097639E-08 | 8.35784078E-02 | 2.55263579E-08 | *APD 204 | | | | |
| 579- | | *APD 204 | -9.64204219E-08 | 1.92363024E-01 | 8.91034801E-08 | -8.73648105E-08 | *APD 205 | | | | |
| 580- | | *APD 205 | 9.74380930E-02 | 2.81852195E-08 | -8.54465156E-08 | 7.53262635E-02 | *APD 206 | | | | |
| 581- | | *APD 206 | 1.58197579E-08 | | | | *APD 207 | | | | |
| 582- | | DMI | *PDU2 | 24 | | | | | | | |
| 583- | | *APD 208 | -6.24349905E-10 | 4.15071991E-05 | 2.90892075E-02 | 1.46213130E-08 | *APD 208 | | | | |
| 584- | | *APD 209 | 1.37305324E-04 | 4.57173320E-08 | -2.96191582E-09 | -1.49250802E-09 | *APD 209 | | | | |
| 585- | | *APD 210 | 5.85078119E-08 | -5.63701660E-09 | 1.24622439E-03 | 7.3687806E-08 | *APD 211 | | | | |
| 586- | | *APD 211 | -1.07301368E-08 | 3.79616814E-03 | 8.98269263E-08 | -2.05073683E-08 | *APD 212 | | | | |
| 587- | | *APD 212 | 1.18346140E-02 | 1.08770507E-07 | -4.39778613E-08 | 3.83404791E-02 | *APD 213 | | | | |
| 588- | | *APD 213 | 1.37076597E-07 | -9.91474849E-08 | 3.17762227E-01 | 1.24202700E-07 | *APD 214 | | | | |
| 589- | | *APD 214 | -5.02217254E-08 | 4.16809320E-02 | 1.21475466E-07 | -3.88245667E-08 | *APD 215 | | | | |
| 590- | | *APD 215 | 2.33946107E-02 | | | | *APD 216 | | | | |
| 591- | | DMI | *PDU2 | 25 | | | | | | | |
| 592- | | *APD 217 | 2.82666814E-10 | -7.05944764E-12 | 1.60361469E-01 | 6.74493535E-10 | *APD 217 | | | | |
| 593- | | *APD 218 | -2.32974612E-11 | 2.40791202E-01 | 1.33202160E-09 | -6.59601627E-11 | *APD 219 | | | | |
| 594- | | *APD 219 | 3.21689129E-01 | 2.51854071E-09 | -2.08764936E-10 | 4.03630455E-01 | *APD 220 | | | | |
| 595- | | *APD 220 | 4.72703121E-09 | -6.26747099E-10 | 4.87991869E-01 | 8.54107188E-09 | *APD 221 | | | | |
| 596- | | *APD 221 | -1.90550908E-09 | 5.78415573E-01 | 1.73096051E-08 | -5.92248028E-09 | *APD 222 | | | | |
| 597- | | *APD 222 | 6.85932934E-01 | 3.52693690E-08 | -1.90943830E-08 | 8.49487364E-01 | *APD 223 | | | | |
| 598- | | *APD 223 | 7.95842539E-08 | -6.515886721E-08 | 7.98646927E-01 | 5.65807095E-08 | *APD 224 | | | | |
| 599- | | *APD 224 | -3.47529614E-08 | | | | *APD 225 | | | | |
| 600- | | DMI | *PDU2 | 26 | | | | | | | |
| | | | | | | | | | | | |

APRIL 11, 1974 NASTRAN 5/13/72

AKISYMMETRIC CIRC. CYL. WITH FLUID
HARMONIC REDUCTION

SORTED BULK DATA ECHO

| CARD
COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------------|----------|-----------------|-----------------|-----------------|-----------------|----------|---|---|---|----|
| 601- | *APD 226 | 7.79266469E-04 | 1.04204501E-11 | -2.0424453E-08 | 1.26341233E-03 | *APD 227 | | | | |
| 602- | *APD 227 | 3.43893941E-11 | -3.06687298E-08 | 3.67997750E-03 | 1.03268186E-10 | *APD 228 | | | | |
| 603- | *APD 228 | -4.09724130E-08 | 6.95797428E-03 | 3.08157722E-10 | -5.14089962E-08 | *APD 229 | | | | |
| 604- | *APD 229 | 1.30593814E-02 | 9.25141297E-10 | -6.21537879E-08 | 2.47015134E-02 | *APD 230 | | | | |
| 605- | *APD 230 | 2.81272183E-09 | -7.36707193E-08 | 4.78218235E-02 | 8.74217321E-09 | *APD 231 | | | | |
| 606- | *APD 231 | -8.73648105E-08 | 9.74306930E-02 | 2.81852195E-08 | -1.08196161E-07 | *APD 232 | | | | |
| 607- | *APD 232 | 2.19867527E-01 | 9.61810642E-08 | -1.01720843E-07 | 1.58315565E-01 | *APD 233 | | | | |
| 608- | *APD 233 | 5.12988443E-08 | | | | *APD 234 | | | | |
| 609- | DMI | *PDU2 | 27 | 1 | 1.45111549E-08 | *APD 235 | | | | |
| 610- | *APD 235 | -4.01648270E-10 | 1.54099833E-05 | 2.90368476E-08 | -9.60437285E-10 | *APD 236 | | | | |
| 611- | *APD 236 | 5.08580005E-05 | 4.36003589E-08 | -1.89672858E-09 | 1.52715307E-04 | *APD 237 | | | | |
| 612- | *APD 237 | 5.82486415E-08 | -3.58626950E-09 | 4.55710804E-04 | 7.30858574E-08 | *APD 238 | | | | |
| 613- | *APD 238 | -6.73104594E-09 | 1.36811961E-03 | 8.83612756E-08 | -1.27316184E-08 | *APD 239 | | | | |
| 614- | *APD 239 | 4.15951386E-03 | 1.04734397E-07 | -2.46488250E-08 | 1.29281208E-02 | *APD 240 | | | | |
| 615- | *APD 240 | 1.24202700E-07 | -5.02217254E-08 | 4.16809320E-02 | 1.53617666E-07 | *APD 241 | | | | |
| 616- | *APD 241 | -1.13323779E-07 | 1.42234468E-01 | 1.44611931E-07 | -8.05679252E-08 | *APD 242 | | | | |
| 617- | *APD 242 | 7.58618712E-02 | | | | *APD 243 | | | | |
| 618- | DMI | *PDU2 | 28 | 1 | 4.00547944E-02 | *APD 244 | | | | |
| 619- | *APD 244 | 1.33540595E-10 | -2.02863334E-12 | 8.01405907E-02 | 3.19180682E-10 | *APD 245 | | | | |
| 620- | *APD 245 | -6.68789503E-12 | 1.20306730E-01 | 6.29697183E-10 | -2.00426481E-11 | *APD 246 | | | | |
| 621- | *APD 246 | 1.60650671E-01 | 1.18810650E-09 | -5.95901245E-11 | 2.01382458E-01 | *APD 247 | | | | |
| 622- | *APD 247 | 2.22023022E-09 | -1.77734605E-10 | 4.2975884E-01 | 4.16090273E-05 | *APD 248 | | | | |
| 623- | *APD 248 | -5.34170042E-10 | 2.86609471E-01 | 7.89725881E-09 | -1.62748353E-09 | *APD 249 | | | | |
| 624- | *APD 249 | 3.35435748E-01 | 1.54265045E-08 | -5.07660947E-09 | 3.59323523E-01 | *APD 250 | | | | |
| 625- | *APD 250 | 3.20127711E-08 | -1.64619237E-08 | 5.14051735E-01 | 7.46293267E-08 | *APD 251 | | | | |
| 626- | *APD 251 | -5.66529046E-08 | | | | *APD 252 | | | | |
| 627- | DMI | *PDU2 | 29 | 1 | -6.67868251E-09 | *APD 253 | | | | |
| 628- | *APD 253 | 3.26033449E-04 | 3.06413835E-12 | -1.37626941E-08 | 7.79266469E-04 | *APD 254 | | | | |
| 629- | *APD 254 | 1.01016938E-11 | -2.06604973E-08 | 1.53737888E-03 | 3.02732978E-11 | *APD 255 | | | | |
| 630- | *APD 255 | -2.75888361E-08 | 2.90071149E-03 | 9.00075847E-11 | -3.45837883E-08 | *APD 256 | | | | |
| 631- | *APD 256 | 5.42059541E-03 | -2.68450145E-10 | -4.17273895E-08 | 1.01586729E-02 | *APD 257 | | | | |
| 632- | *APD 257 | 8.06834155E-10 | -4.92199810E-08 | 1.92809217E-02 | 2.45822407E-09 | *APD 258 | | | | |
| 633- | *APD 258 | -5.74059070E-08 | 3.76631580E-02 | 7.66792141E-09 | -8.88765272E-08 | *APD 259 | | | | |
| 634- | *APD 259 | 7.81577824E-02 | 2.40040284E-08 | -8.82790232E-08 | 1.82204425E-01 | *APD 260 | | | | |
| 635- | *APD 260 | 8.55710596E-08 | | | | *APD 261 | | | | |
| 636- | DMI | *PDU2 | 30 | 1 | 7.54629781E-09 | *APD 262 | | | | |
| 637- | *APD 262 | -1.56397770E-10 | 4.67430073E-06 | 1.50984434E-08 | -3.73812759E-10 | *APD 263 | | | | |
| 638- | *APD 263 | 1.54099833E-05 | 2.26657129E-08 | -7.37477857E-10 | 4.61814925E-05 | *APD 264 | | | | |
| 639- | *APD 264 | 3.02664880E-08 | -1.39146605E-09 | 1.37303309E-04 | 3.79403389E-08 | *APD 265 | | | | |
| 640- | *APD 265 | -2.60025090E-09 | 4.09529079E-08 | 4.57772664E-08 | -4.87309748E-09 | *APD 266 | | | | |
| 641- | *APD 266 | 1.23081426E-03 | 5.39970593E-08 | -9.2490210E-09 | 3.74998641E-03 | *APD 267 | | | | |
| 642- | *APD 267 | 6.31958783E-08 | -1.80669488E-08 | 1.16973072E-02 | 7.52322649E-08 | *APD 268 | | | | |
| 643- | *APD 268 | -3.74921640E-08 | 3.79309468E-02 | 9.68470317E-08 | -8.74031230E-08 | *APD 269 | | | | |
| 644- | *APD 269 | 1.30537450E-01 | | | | *APD 270 | | | | |
| 645- | DMI | TU12 | 0 | 1 | 15 | 30 | | | | |
| 646- | DMI | *TU12 | 1 | 1 | -1.69592805E-01 | *ATU 0 | | | | |
| 647- | *ATU 1 | -6.53458869E-08 | -7.94370294E-08 | -1.74978077E-01 | 4.56155472E-08 | *ATU 2 | | | | |
| 648- | *ATU 2 | -8.09579319E-08 | -2.44192898E-01 | 6.51131700E-08 | -1.07940553E-07 | *ATU 3 | | | | |
| 649- | *ATU 3 | -4.15904641E-01 | 6.76216132E-06 | -1.56354529E-07 | -8.77412558E-01 | *ATU 4 | | | | |
| 650- | *ATU 4 | 7.80204346E-08 | -2.30857353E-07 | | | *ATU 5 | | | | |

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OF POOR QUALITY

EXPORTED BULK DATA ECHO

CARD

| | | | | | | | | | | | |
|-----|-----|---|---|---|---|---|---|---|---|---|----|
| 634 | DMI | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 635 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 636 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 637 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 638 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 639 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 640 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 641 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 642 | DMI | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 643 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 644 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 645 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 646 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 647 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 648 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 649 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 650 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 651 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 652 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 653 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 654 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 655 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 656 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 657 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 658 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 659 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 660 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 661 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 662 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 663 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 664 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 665 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 666 | DMI | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 667 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 668 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 669 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 670 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 671 | DMI | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 672 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 673 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 674 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 675 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 676 | DMI | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 677 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 678 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 679 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 680 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 681 | DMI | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 682 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 683 | ATU | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

CARD
COUNT

SORTED BULK DATA ECHO

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------|------|-----|-----------------|-----------------|------------------|-----------------|------|-----|-----------------|------|
| 701- | DMI | 1 | 12 | | | | | | | |
| 702- | *ATU | 56 | -2.58221239E-10 | 2.37231143E-04 | -6.75348133E-08 | 7.01167835E-09 | *ATU | 56 | -7.58429906E-08 | *ATU |
| 703- | *ATU | 57 | 1.43702666E-04 | -7.18693514E-08 | 1.92447764E-08 | -2.58036540E-03 | *ATU | 58 | -2.58036540E-03 | *ATU |
| 704- | *ATU | 58 | -7.74575142E-08 | 3.49179459E-08 | -9.24630463E-03 | -7.99266786E-08 | *ATU | 59 | -7.99266786E-08 | *ATU |
| 705- | *ATU | 59 | 4.45055507E-08 | -1.50015876E-02 | | | *ATU | 60 | | *ATU |
| 706- | DMI | 13 | | | | | | | | |
| 707- | *ATU | 61 | -1.70973919E-07 | -2.03524905E-07 | -3.87164593E-01 | 1.27367002E-07 | *ATU | 62 | -4.42730427E-01 | *ATU |
| 708- | *ATU | 62 | -1.77971685E-07 | -3.97632957E-01 | 1.49531672E-07 | -1.91305958E-07 | *ATU | 63 | -1.91305958E-07 | *ATU |
| 709- | *ATU | 63 | -4.07383442E-01 | 1.41330304E-07 | -2.07236837E-07 | -4.04424787E-01 | *ATU | 64 | -4.04424787E-01 | *ATU |
| 710- | *ATU | 64 | 1.39883696E-07 | -2.23572044E-07 | | | *ATU | 65 | | *ATU |
| 711- | DMI | 14 | | | | | | | | |
| 712- | *ATU | 66 | 3.22924461E-04 | -1.90480770E-10 | 5.06905877E-08 | -8.22463255E-03 | *ATU | 67 | 5.64511602E-08 | *ATU |
| 713- | *ATU | 67 | 5.97638206E-09 | 5.44489751E-08 | -1.94023177E-02 | 1.31239091E-08 | *ATU | 68 | -1.31239091E-08 | *ATU |
| 714- | *ATU | 68 | 5.75337751E-08 | -3.03312577E-02 | 1.84945490E-08 | 5.80380615E-08 | *ATU | 69 | 5.80380615E-08 | *ATU |
| 715- | *ATU | 69 | -3.47727127E-02 | 2.97705320E-08 | | | *ATU | 70 | | *ATU |
| 716- | DMI | 15 | | | | | | | | |
| 717- | *ATU | 71 | -2.31736977E-10 | 8.58500200E-05 | -7.00920850E-08 | -8.01463216E-08 | *ATU | 71 | -8.01463216E-08 | *ATU |
| 718- | *ATU | 72 | 5.41246263E-05 | -7.22270196E-08 | 1.06746150E-02 | -9.61648067E-04 | *ATU | 72 | -9.61648067E-04 | *ATU |
| 719- | *ATU | 73 | -7.45846478E-08 | 1.78230337E-08 | -3.25128413E-03 | -7.45738475E-08 | *ATU | 73 | -7.45738475E-08 | *ATU |
| 720- | *ATU | 74 | 2.12705373E-08 | -4.89497930E-03 | | | *ATU | 74 | | *ATU |
| 721- | DMI | 16 | | | | | | | | |
| 722- | *ATU | 76 | -1.75682089E-07 | -2.09040024E-07 | -3.93651578E-01 | -4.54785228E-01 | *ATU | 76 | -4.54785228E-01 | *ATU |
| 723- | *ATU | 77 | -1.81029293E-07 | -3.99081230E-01 | 1.53190342E-07 | -1.92287075E-07 | *ATU | 77 | -1.92287075E-07 | *ATU |
| 724- | *ATU | 78 | -4.03595984E-01 | 1.44913599E-07 | -2.06271409E-07 | -3.58267329E-01 | *ATU | 78 | -3.58267329E-01 | *ATU |
| 725- | *ATU | 79 | 1.43416401E-07 | -2.21632718E-07 | | | *ATU | 79 | | *ATU |
| 726- | DMI | 17 | | | | | | | | |
| 727- | *ATU | 81 | 1.85694924E-04 | -1.22492621E-10 | 5.09538474E-08 | -4.71456721E-03 | *ATU | 81 | 5.79601291E-08 | *ATU |
| 728- | *ATU | 82 | 3.41804073E-09 | 5.29066226E-08 | -1.08698085E-02 | 7.48385176E-09 | *ATU | 82 | -4.71456721E-03 | *ATU |
| 729- | *ATU | 83 | 5.44400542E-08 | -1.65195614E-02 | 1.05035804E-08 | 5.42176130E-08 | *ATU | 83 | 7.48385176E-09 | *ATU |
| 730- | *ATU | 84 | -1.85996480E-02 | 1.17827028E-08 | | | *ATU | 84 | 5.42176130E-08 | *ATU |
| 731- | DMI | 18 | | | | | | | | |
| 732- | *ATU | 86 | -1.18702201E-10 | 3.02016124E-05 | -7.13107511E-08 | -8.23416713E-08 | *ATU | 86 | -8.23416713E-08 | *ATU |
| 733- | *ATU | 87 | 1.95277244E-05 | -7.23437065E-08 | 5.84302926E-09 | -3.44428699E-04 | *ATU | 87 | 2.41607068E-09 | *ATU |
| 734- | *ATU | 88 | -7.33625143E-08 | 9.27067970E-09 | -1.12278201E-03 | -7.23605673E-08 | *ATU | 88 | -3.44428699E-04 | *ATU |
| 735- | *ATU | 89 | 1.06979397E-08 | -1.62140244E-03 | | | *ATU | 89 | -7.23605673E-08 | *ATU |
| 736- | DMI | 19 | | | | | | | | |
| 737- | *ATU | 91 | -1.78030291E-07 | -2.11789258E-07 | -3.97028327E-01 | 1.22697153E-07 | *ATU | 91 | -4.60786581E-01 | *ATU |
| 738- | *ATU | 92 | -1.82483575E-07 | -3.90620175E-01 | 1.55135665E-07 | -1.92649452E-07 | *ATU | 92 | 1.22697153E-07 | *ATU |
| 739- | *ATU | 93 | -4.01751066E-01 | 1.46910224E-07 | -2.05665344E-07 | -3.95488381E-01 | *ATU | 93 | -1.92649452E-07 | *ATU |
| 740- | *ATU | 94 | 1.43423598E-07 | -2.20575594E-07 | | | *ATU | 94 | -3.95488381E-01 | *ATU |
| 741- | DMI | 20 | | | | | | | | |
| 742- | *ATU | 96 | 1.03495579E-04 | -7.40951104E-11 | 5.10162020E-08 | -2.07342901E-03 | *ATU | 96 | 5.67090625E-08 | *ATU |
| 743- | *ATU | 97 | 1.93540139E-09 | 5.20904173E-08 | -6.08104095E-03 | 4.23547415E-09 | *ATU | 97 | -2.07342901E-03 | *ATU |
| 744- | *ATU | 98 | 5.28640278E-08 | -9.10000676E-03 | 5.94527449E-09 | 5.22793044E-08 | *ATU | 98 | 4.23547415E-09 | *ATU |
| 745- | *ATU | 99 | -1.01599619E-02 | 6.66802000E-09 | | | *ATU | 99 | 5.22793044E-08 | *ATU |
| 746- | DMI | 21 | | | | | | | | |
| 747- | *ATU | 101 | -6.23653906E-11 | 1.04690889E-05 | -7.188888487E-08 | -9.34327807E-08 | *ATU | 101 | -9.34327807E-08 | *ATU |
| 748- | *ATU | 102 | 6.87701959E-06 | -7.23883318E-08 | 3.21894400E-09 | -1.20705357E-04 | *ATU | 102 | 1.37305389E-09 | *ATU |
| 749- | *ATU | 103 | -7.28427949E-08 | 4.94939911E-09 | -3.84650420E-04 | -7.17609518E-08 | *ATU | 103 | -1.20705357E-04 | *ATU |
| 750- | *ATU | 104 | 5.60878908E-09 | -5.44076087E-04 | | | *ATU | 104 | -7.17609518E-08 | *ATU |

SORTED BULK DATA ECHO

| CARD | COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------|-------|-------|-----------------|-----------------|-----------------|-----------------|------|-----|---|---|----|
| 751- | DMI | *TUI2 | 22 | | | | | | | | |
| 752- | *ATU | 106 | -1.79166364E-07 | -2.13118369E-07 | -3.98516715E-01 | -4.62685215E-01 | *ATU | 106 | | | |
| 753- | *ATU | 107 | -1.83165639E-07 | -3.99830520E-01 | 1.56147109E-07 | 1.52786899E-07 | *ATU | 107 | | | |
| 754- | *ATU | 108 | -4.00879323E-01 | 1.47980999E-07 | -2.05333151E-07 | -3.58220412E-01 | *ATU | 109 | | | |
| 755- | *ATU | 109 | 1.46523348E-07 | -2.20032007E-07 | | | *ATU | 110 | | | |
| 756- | DMI | *TUI2 | 23 | | | | | | | | |
| 757- | *ATU | 111 | 6.15481113E-05 | -4.48905496E-11 | 5.10188566E-08 | -1.55803524E-03 | *ATU | 111 | | | |
| 758- | *ATU | 112 | 1.12685350E-09 | 5.16143395E-08 | -3.51606798E-03 | 2.46764764E-09 | *ATU | 112 | | | |
| 759- | *ATU | 113 | 5.20298649E-08 | -5.21713868E-03 | 3.46802831E-05 | 5.12994944E-08 | *ATU | 114 | | | |
| 760- | *ATU | 114 | -5.80099225E-03 | 3.89208665E-09 | | | *ATU | 115 | | | |
| 761- | DMI | *TUI2 | 24 | | | | | | | | |
| 762- | *ATU | 116 | -3.45174167E-11 | 3.63309027E-06 | -7.21593096E-08 | 8.01345656E-10 | *ATU | 117 | | | |
| 763- | *ATU | 117 | 2.41035650E-06 | -7.24077722E-08 | 1.24184401E-09 | -4.21711553E-05 | *ATU | 118 | | | |
| 764- | *ATU | 118 | -7.26210487E-08 | 2.77927938E-09 | -1.32504298E-04 | -7.14327939E-08 | *ATU | 119 | | | |
| 765- | *ATU | 119 | 3.11660941E-09 | -1.85157555E-04 | | | *ATU | 120 | | | |
| 766- | DMI | *TUI2 | 25 | | | | | | | | |
| 767- | *ATU | 121 | -1.79672725E-07 | -2.13710337E-07 | -3.99167240E-01 | 1.34018137E-07 | *ATU | 121 | | | |
| 768- | *ATU | 122 | -1.83463897E-07 | 3.99911940E-01 | 1.56627777E-07 | -1.92838172E-07 | *ATU | 123 | | | |
| 769- | *ATU | 123 | -4.00495172E-01 | 1.49516563E-07 | -2.05174331E-07 | -3.53673599E-01 | *ATU | 124 | | | |
| 770- | *ATU | 124 | 1.47066203E-07 | -2.19779963E-07 | | | *ATU | 125 | | | |
| 771- | DMI | *TUI2 | 26 | | | | | | | | |
| 772- | *ATU | 126 | 4.00548161E-05 | -2.98809449E-11 | 5.10104030E-08 | -1.01333461E-03 | *ATU | 126 | | | |
| 773- | *ATU | 127 | 7.32460981E-10 | 5.13817362E-08 | -2.27672490E-03 | 1.60557057E-09 | *ATU | 127 | | | |
| 774- | *ATU | 128 | 5.16357268E-08 | 3.36289173E-03 | 2.25971553E-09 | 5.08413756E-08 | *ATU | 129 | | | |
| 775- | *ATU | 129 | -3.73170897E-03 | 2.53701707E-09 | | | *ATU | 130 | | | |
| 776- | DMI | *TUI2 | 27 | | | | | | | | |
| 777- | *ATU | 131 | -2.17147272E-11 | 1.36434301E-06 | -7.22774871E-08 | 5.21665822E-10 | *ATU | 131 | | | |
| 778- | *ATU | 132 | 9.11016571E-07 | -7.24162087E-08 | 1.18464660E-09 | -1.59047486E-05 | *ATU | 132 | | | |
| 779- | *ATU | 133 | -7.25306109E-08 | 1.76667725E-09 | -4.95233689E-05 | -7.13017658E-08 | *ATU | 133 | | | |
| 780- | *ATU | 134 | 1.97041983E-09 | -6.87181455E-05 | | | *ATU | 134 | | | |
| 781- | DMI | *TUI2 | 28 | | | | | | | | |
| 782- | *ATU | 136 | -8.99072461E-08 | -1.06933899E-07 | -1.99674845E-01 | 6.70488529E-08 | *ATU | 136 | | | |
| 783- | *ATU | 137 | -9.17738134E-08 | -1.99966729E-01 | 7.83391556E-02 | -9.64258220E-08 | *ATU | 137 | | | |
| 784- | *ATU | 138 | -2.00193584E-01 | 7.42700763E-08 | -1.02564343E-07 | -1.96760555E-01 | *ATU | 138 | | | |
| 785- | *ATU | 139 | 7.35402637E-08 | -1.09844113E-07 | | | *ATU | 139 | | | |
| 786- | DMI | *TUI2 | 29 | | | | | | | | |
| 787- | *ATU | 141 | 1.68243278E-05 | -1.26588722E-11 | 3.43618716E-08 | -4.25543403E-04 | *ATU | 141 | | | |
| 788- | *ATU | 142 | 3.0752230E-10 | 3.45278188E-08 | -9.54627758E-04 | 6.74544198E-10 | *ATU | 142 | | | |
| 789- | *ATU | 143 | 3.46417295E-08 | -1.40788918E-03 | 9.50190371E-10 | 3.40831612E-08 | *ATU | 143 | | | |
| 790- | *ATU | 144 | -1.56127731E-03 | 1.06756182E-09 | | | *ATU | 144 | | | |
| 791- | DMI | *TUI2 | 30 | | | | | | | | |
| 792- | *ATU | 146 | -8.40378114E-12 | 4.15984232E-07 | -3.76185589E-08 | 2.03946401E-10 | *ATU | 146 | | | |
| 793- | *ATU | 147 | 2.78612731E-07 | -3.76747700E-08 | 4.61353994E-10 | -4.85905164E-06 | *ATU | 147 | | | |
| 794- | *ATU | 148 | -3.77201523E-08 | 6.85522750E-10 | -1.50657806E-05 | -3.70752993E-08 | *ATU | 148 | | | |
| 795- | *ATU | 149 | 7.63210606E-10 | -2.78410784E-05 | | | *ATU | 149 | | | |
| 796- | EIGR | 1 | GIV | 0.0 | 10.24 | 25 | 0 | 0 | | | |
| 797- | EIG | MAX | | | | | | | | | |
| 798- | GRID | 2 | 1 | 1.0000 | 0.000 | 1.0000 | 1 | | | | |
| 799- | GRID | 3 | 1 | 1.0000 | 9.0000 | 1.0000 | 1 | | | | |
| 800- | GRID | 4 | 1 | 1.0000 | 18.0000 | 1.0000 | 1 | | | | |

APRIL 11, 1974 NASTRAN 5/13/72

AXISYMMETRIC CIRC. CYL. WITH FLUID
HARMONIC REDUCTION

SORTED BULK DATA ECHO

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|------|----|---|--------|---------|--------|---|---|---|----|
| COUNT | 5 | | | | | | | | | |
| 801- | GRID | 5 | 1 | 1.0000 | 27.0000 | 1.0000 | 1 | | | |
| 802- | GRID | 6 | 1 | 1.0000 | 36.0000 | 1.0000 | 1 | | | |
| 803- | GRID | 7 | 1 | 1.0000 | 45.0000 | 1.0000 | 1 | | | |
| 804- | GRID | 8 | 1 | 1.0000 | 54.0000 | 1.0000 | 1 | | | |
| 805- | GRID | 9 | 1 | 1.0000 | 63.0000 | 1.0000 | 1 | | | |
| 806- | GRID | 10 | 1 | 1.0000 | 72.0000 | 1.0000 | 1 | | | |
| 807- | GRID | 11 | 1 | 1.0000 | 81.0000 | 1.0000 | 1 | | | |
| 808- | GRID | 12 | 1 | 1.0000 | 90.0000 | 1.0000 | 1 | | | |
| 809- | GRID | 13 | 1 | 1.0000 | .0000 | .8000 | 1 | | | |
| 810- | GRID | 14 | 1 | 1.0000 | 9.0000 | .8000 | 1 | | | |
| 811- | GRID | 15 | 1 | 1.0000 | 18.0000 | .8000 | 1 | | | |
| 812- | GRID | 16 | 1 | 1.0000 | 27.0000 | .8000 | 1 | | | |
| 813- | GRID | 17 | 1 | 1.0000 | 36.0000 | .8000 | 1 | | | |
| 814- | GRID | 18 | 1 | 1.0000 | 45.0000 | .8000 | 1 | | | |
| 815- | GRID | 19 | 1 | 1.0000 | 54.0000 | .8000 | 1 | | | |
| 816- | GRID | 20 | 1 | 1.0000 | 63.0000 | .8000 | 1 | | | |
| 817- | GRID | 21 | 1 | 1.0000 | 72.0000 | .8000 | 1 | | | |
| 818- | GRID | 22 | 1 | 1.0000 | 81.0000 | .8000 | 1 | | | |
| 819- | GRID | 23 | 1 | 1.0000 | 90.0000 | .8000 | 1 | | | |
| 820- | GRID | 24 | 1 | 1.0000 | .0000 | .6000 | 1 | | | |
| 821- | GRID | 25 | 1 | 1.0000 | 9.0000 | .6000 | 1 | | | |
| 822- | GRID | 26 | 1 | 1.0000 | 18.0000 | .6000 | 1 | | | |
| 823- | GRID | 27 | 1 | 1.0000 | 27.0000 | .6000 | 1 | | | |
| 824- | GRID | 28 | 1 | 1.0000 | 36.0000 | .6000 | 1 | | | |
| 825- | GRID | 29 | 1 | 1.0000 | 45.0000 | .6000 | 1 | | | |
| 826- | GRID | 30 | 1 | 1.0000 | 54.0000 | .6000 | 1 | | | |
| 827- | GRID | 31 | 1 | 1.0000 | 63.0000 | .6000 | 1 | | | |
| 828- | GRID | 32 | 1 | 1.0000 | 72.0000 | .6000 | 1 | | | |
| 829- | GRID | 33 | 1 | 1.0000 | 81.0000 | .6000 | 1 | | | |
| 830- | GRID | 34 | 1 | 1.0000 | 90.0000 | .6000 | 1 | | | |
| 831- | GRID | 35 | 1 | 1.0000 | .0000 | .4000 | 1 | | | |
| 832- | GRID | 36 | 1 | 1.0000 | 9.0000 | .4000 | 1 | | | |
| 833- | GRID | 37 | 1 | 1.0000 | 18.0000 | .4000 | 1 | | | |
| 834- | GRID | 38 | 1 | 1.0000 | 27.0000 | .4000 | 1 | | | |
| 835- | GRID | 39 | 1 | 1.0000 | 36.0000 | .4000 | 1 | | | |
| 836- | GRID | 40 | 1 | 1.0000 | 45.0000 | .4000 | 1 | | | |
| 837- | GRID | 41 | 1 | 1.0000 | 54.0000 | .4000 | 1 | | | |
| 838- | GRID | 42 | 1 | 1.0000 | 63.0000 | .4000 | 1 | | | |
| 839- | GRID | 43 | 1 | 1.0000 | 72.0000 | .4000 | 1 | | | |
| 840- | GRID | 44 | 1 | 1.0000 | 81.0000 | .4000 | 1 | | | |
| 841- | GRID | 45 | 1 | 1.0000 | 90.0000 | .4000 | 1 | | | |
| 842- | GRID | 46 | 1 | 1.0000 | .0000 | .2000 | 1 | | | |
| 843- | GRID | 47 | 1 | 1.0000 | 9.0000 | .2000 | 1 | | | |
| 844- | GRID | 48 | 1 | 1.0000 | 18.0000 | .2000 | 1 | | | |
| 845- | GRID | 49 | 1 | 1.0000 | 27.0000 | .2000 | 1 | | | |
| 846- | GRID | 50 | 1 | 1.0000 | 36.0000 | .2000 | 1 | | | |
| 847- | GRID | 51 | 1 | 1.0000 | 45.0000 | .2000 | 1 | | | |
| 848- | GRID | 52 | 1 | 1.0000 | 54.0000 | .2000 | 1 | | | |
| 849- | GRID | 53 | 1 | 1.0000 | 63.0000 | .2000 | 1 | | | |
| 850- | GRID | 54 | 1 | 1.0000 | 72.0000 | .2000 | 1 | | | |

ORIGINAL PAGE IS
OF POOR QUALITY

APRIL 11, 1974 NASTRAN 5/13/72

AXIS INETRIC CIRC. CYL. WITH FLUID
HARMONIC REDUCTION

| SORTED BULK DATA ECHO | | | | | | | | | |
|-----------------------|------|-----|----|--------|---------|----------|----|----|----|
| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| COUNT | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| 851- | GRID | 55 | 1 | 1.0000 | 81.0000 | .2000 | 1 | | |
| 852- | GRID | 56 | 1 | 1.0000 | 90.0000 | .2000 | 1 | | |
| 853- | GRID | 57 | 1 | 1.0000 | .0000 | .0000 | 1 | | |
| 854- | GRID | 58 | 1 | 1.0000 | 9.0000 | .0000 | 1 | | |
| 855- | GRID | 59 | 1 | 1.0000 | 18.0000 | .0000 | 1 | | |
| 856- | GRID | 60 | 1 | 1.0000 | 27.0000 | .0000 | 1 | | |
| 857- | GRID | 61 | 1 | 1.0000 | 36.0000 | .0000 | 1 | | |
| 858- | GRID | 62 | 1 | 1.0000 | 45.0000 | .0000 | 1 | | |
| 859- | GRID | 63 | 1 | 1.0000 | 54.0000 | .0000 | 1 | | |
| 860- | GRID | 64 | 1 | 1.0000 | 63.0000 | .0000 | 1 | | |
| 861- | GRID | 65 | 1 | 1.0000 | 72.0000 | .0000 | 1 | | |
| 862- | GRID | 66 | 1 | 1.0000 | 81.0000 | .0000 | 1 | | |
| 863- | GRID | 67 | 1 | 1.0000 | 90.0000 | .0000 | 1 | | |
| 864- | GRID | 68 | 1 | 1.0000 | .0000 | -.0.1999 | 1 | | |
| 865- | GRID | 69 | 1 | 1.0000 | 9.0000 | -.0.1999 | 1 | | |
| 866- | GRID | 70 | 1 | 1.0000 | 18.0000 | -.0.1999 | 1 | | |
| 867- | GRID | 71 | 1 | 1.0000 | 27.0000 | -.0.1999 | 1 | | |
| 868- | GRID | 72 | 1 | 1.0000 | 36.0000 | -.0.1999 | 1 | | |
| 869- | GRID | 73 | 1 | 1.0000 | 45.0000 | -.0.1999 | 1 | | |
| 870- | GRID | 74 | 1 | 1.0000 | 54.0000 | -.0.1999 | 1 | | |
| 871- | GRID | 75 | 1 | 1.0000 | 63.0000 | -.0.1999 | 1 | | |
| 872- | GRID | 76 | 1 | 1.0000 | 72.0000 | -.0.1999 | 1 | | |
| 873- | GRID | 77 | 1 | 1.0000 | 81.0000 | -.0.1999 | 1 | | |
| 874- | GRID | 78 | 1 | 1.0000 | 90.0000 | -.0.1999 | 1 | | |
| 875- | GRID | 79 | 1 | 1.0000 | .0000 | -.0.3999 | 1 | | |
| 876- | GRID | 80 | 1 | 1.0000 | 9.0000 | -.0.3999 | 1 | | |
| 877- | GRID | 81 | 1 | 1.0000 | 18.0000 | -.0.3999 | 1 | | |
| 878- | GRID | 82 | 1 | 1.0000 | 27.0000 | -.0.3999 | 1 | | |
| 879- | GRID | 83 | 1 | 1.0000 | 36.0000 | -.0.3999 | 1 | | |
| 880- | GRID | 84 | 1 | 1.0000 | 45.0000 | -.0.3999 | 1 | | |
| 881- | GRID | 85 | 1 | 1.0000 | 54.0000 | -.0.3999 | 1 | | |
| 882- | GRID | 86 | 1 | 1.0000 | 63.0000 | -.0.3999 | 1 | | |
| 883- | GRID | 87 | 1 | 1.0000 | 72.0000 | -.0.3999 | 1 | | |
| 884- | GRID | 88 | 1 | 1.0000 | 81.0000 | -.0.3999 | 1 | | |
| 885- | GRID | 89 | 1 | 1.0000 | 90.0000 | -.0.3999 | 1 | | |
| 886- | GRID | 90 | 1 | 1.0000 | .0000 | -.0.6000 | 1 | | |
| 887- | GRID | 91 | 1 | 1.0000 | 9.0000 | -.0.6000 | 1 | | |
| 888- | GRID | 92 | 1 | 1.0000 | 18.0000 | -.0.6000 | 1 | | |
| 889- | GRID | 93 | 1 | 1.0000 | 27.0000 | -.0.6000 | 1 | | |
| 890- | GRID | 94 | 1 | 1.0000 | 36.0000 | -.0.6000 | 1 | | |
| 891- | GRID | 95 | 1 | 1.0000 | 45.0000 | -.0.6000 | 1 | | |
| 892- | GRID | 96 | 1 | 1.0000 | 54.0000 | -.0.6000 | 1 | | |
| 893- | GRID | 97 | 1 | 1.0000 | 63.0000 | -.0.6000 | 1 | | |
| 894- | GRID | 98 | 1 | 1.0000 | 72.0000 | -.0.6000 | 1 | | |
| 895- | GRID | 99 | 1 | 1.0000 | 81.0000 | -.0.6000 | 1 | | |
| 896- | GRID | 100 | 1 | 1.0000 | 90.0000 | -.0.6000 | 1 | | |
| 897- | GRID | 101 | 1 | 1.0000 | .0000 | -.0.7999 | 1 | | |
| 898- | GRID | 102 | 1 | 1.0000 | 9.0000 | -.0.7999 | 1 | | |
| 899- | GRID | 103 | 1 | 1.0000 | 18.0000 | -.0.7999 | 1 | | |
| 900- | GRID | 104 | 1 | 1.0000 | 27.0000 | -.0.7999 | 1 | | |

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AXISYMMETRIC CIRC. CYL. WITH FLUID
HARMONIC REDUCTION

| SORTED BULK DATA ECHO | | | | | | | | | |
|-----------------------|------|-------|-----|--------|---------|---------|-----|-----|-----|
| CASE | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| COUNT | 105 | 106 | 107 | 108 | 109 | 110 | 111 | 112 | 113 |
| 901- | GRID | 105 | 1 | 1.0000 | 36.0000 | -0.7999 | 1 | | |
| 902- | GRID | 106 | 1 | 1.0000 | 45.0000 | -0.7999 | 1 | | |
| 903- | GRID | 107 | 1 | 1.0000 | 54.0000 | -0.7999 | 1 | | |
| 904- | GRID | 108 | 1 | 1.0000 | 63.0000 | -0.7999 | 1 | | |
| 905- | GRID | 109 | 1 | 1.0000 | 72.0000 | -0.7999 | 1 | | |
| 906- | GRID | 110 | 1 | 1.0000 | 81.0000 | -0.7999 | 1 | | |
| 907- | GRID | 111 | 1 | 1.0000 | 90.0000 | -0.7999 | 1 | | |
| 908- | GRID | 112 | 1 | 1.0000 | .0000 | -1.0000 | 1 | | |
| 909- | GRID | 113 | 1 | 1.0000 | 9.0000 | -1.0000 | 1 | | |
| 910- | GRID | 114 | 1 | 1.0000 | 18.0000 | -1.0000 | 1 | | |
| 911- | GRID | 115 | 1 | 1.0000 | 27.0000 | -1.0000 | 1 | | |
| 912- | GRID | 116 | 1 | 1.0000 | 36.0000 | -1.0000 | 1 | | |
| 913- | GRID | 117 | 1 | 1.0000 | 45.0000 | -1.0000 | 1 | | |
| 914- | GRID | 118 | 1 | 1.0000 | 54.0000 | -1.0000 | 1 | | |
| 915- | GRID | 119 | 1 | 1.0000 | 63.0000 | -1.0000 | 1 | | |
| 916- | GRID | 120 | 1 | 1.0000 | 72.0000 | -1.0000 | 1 | | |
| 917- | GRID | 121 | 1 | 1.0000 | 81.0000 | -1.0000 | 1 | | |
| 918- | GRID | 122 | 1 | 1.0000 | 90.0000 | -1.0000 | 1 | | |
| 919- | GRID | 1001 | 1 | 1. | 0.0 | 0.0 | 1 | | |
| 920- | GRID | 1002 | 1 | 1. | 0.0 | 0.0 | 1 | | |
| 921- | GRID | 1003 | 1 | 1. | 0.0 | 0.0 | 1 | | |
| 922- | GRID | 2001 | 1 | 1. | 0.0 | 0.0 | 1 | | |
| 923- | GRID | 2002 | 1 | 1. | 0.0 | 0.0 | 1 | | |
| 924- | GRID | 2003 | 1 | 1. | 0.0 | 0.0 | 1 | | |
| 925- | GRID | 3001 | 1 | 1. | 0.0 | 0.0 | 1 | | |
| 926- | GRID | 3002 | 1 | 1. | 0.0 | 0.0 | 1 | | |
| 927- | GRID | 3003 | 1 | 1. | 0.0 | 0.0 | 1 | | |
| 928- | GRID | 4001 | 1 | 1. | 0.0 | 0.0 | 1 | | |
| 929- | GRID | 4002 | 1 | 1. | 0.0 | 0.0 | 1 | | |
| 930- | GRID | 4003 | 1 | 1. | 0.0 | 0.0 | 1 | | |
| 931- | GRID | 5001 | 1 | 1. | 0.0 | 0.0 | 1 | | |
| 932- | GRID | 5002 | 1 | 1. | 0.0 | 0.0 | 1 | | |
| 933- | GRID | 5003 | 1 | 1. | 0.0 | 0.0 | 1 | | |
| 934- | GRID | 6001 | 1 | 1. | 0.0 | 0.0 | 1 | | |
| 935- | GRID | 6002 | 1 | 1. | 0.0 | 0.0 | 1 | | |
| 936- | GRID | 6003 | 1 | 1. | 0.0 | 0.0 | 1 | | |
| 937- | GRID | 7001 | 1 | 1. | 0.0 | 0.0 | 1 | | |
| 938- | GRID | 7002 | 1 | 1. | 0.0 | 0.0 | 1 | | |
| 939- | GRID | 7003 | 1 | 1. | 0.0 | 0.0 | 1 | | |
| 940- | GRID | 8001 | 1 | 1. | 0.0 | 0.0 | 1 | | |
| 941- | GRID | 8002 | 1 | 1. | 0.0 | 0.0 | 1 | | |
| 942- | GRID | 8003 | 1 | 1. | 0.0 | 0.0 | 1 | | |
| 943- | GRID | 9001 | 1 | 1. | 0.0 | 0.0 | 1 | | |
| 944- | GRID | 9002 | 1 | 1. | 0.0 | 0.0 | 1 | | |
| 945- | GRID | 9003 | 1 | 1. | 0.0 | 0.0 | 1 | | |
| 946- | GRID | 10001 | 1 | 1. | 0.0 | 0.0 | 1 | | |
| 947- | GRID | 10002 | 1 | 1. | 0.0 | 0.0 | 1 | | |
| 948- | GRID | 10003 | 1 | 1. | 0.0 | 0.0 | 1 | | |
| 949- | GRID | 11001 | 1 | 1. | 0.0 | 0.0 | 1 | | |
| 950- | GRID | 11002 | 1 | 1. | 0.0 | 0.0 | 1 | | |

SORTED BULK DATA ECHO

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---------|-------|------|-----|----------|------|---|---------|---|---------|
| COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 951- | GRID | 11003 | 1 | 1. | 0.0 | 0.0 | 1 | | | |
| 952- | MAT1 | 1 | 1. | 0.0 | 0.0 | 0.0 | 1 | | | |
| 953- | MPC | 1 | 2 | 1 | -1.00000 | 1001 | 1 | 1.00000 | | EM11011 |
| 954- | EM11011 | 1 | 1002 | 1 | 1.00000 | 1003 | 1 | 1.00000 | | EM11012 |
| 955- | MPC | 1 | 2 | 2 | -1.00000 | 1001 | 2 | 0.00000 | | EM11013 |
| 956- | EM11012 | 1 | 1002 | 2 | 2.00000 | 1003 | 3 | 2.00000 | | EM11014 |
| 957- | MPC | 1 | 2 | 3 | -1.00000 | 1001 | 3 | 1.00000 | | EM11015 |
| 958- | EM11013 | 1 | 1002 | 3 | 1.00000 | 1003 | 4 | 0.00000 | | EM11016 |
| 959- | MPC | 1 | 2 | 4 | -1.00000 | 1001 | 4 | 1.00000 | | EM11017 |
| 960- | EM11014 | 1 | 1002 | 5 | 1.00000 | 1003 | 5 | 1.00000 | | EM11018 |
| 961- | MPC | 1 | 2 | 6 | -1.00000 | 1001 | 6 | 0.00000 | | EM11019 |
| 962- | EM11015 | 1 | 1002 | 6 | 0.00000 | 1003 | 6 | 0.00000 | | EM11020 |
| 963- | MPC | 1 | 3 | 1 | -1.00000 | 1001 | 1 | 1.00000 | | EM11021 |
| 964- | EM11016 | 1 | 1002 | 2 | 1.00000 | 1003 | 2 | 0.00000 | | EM11022 |
| 965- | MPC | 1 | 3 | 2 | -1.00000 | 1001 | 2 | 1.00000 | | EM11023 |
| 966- | EM11021 | 1 | 1002 | 3 | 0.95105 | 1003 | 3 | 0.80901 | | EM11024 |
| 967- | MPC | 1 | 3 | 4 | -1.00000 | 1001 | 4 | 0.00000 | | EM11025 |
| 968- | EM11022 | 1 | 1002 | 5 | 1.00000 | 1003 | 5 | 1.00000 | | EM11026 |
| 969- | MPC | 1 | 3 | 6 | -1.00000 | 1001 | 6 | 0.00000 | | EM11027 |
| 970- | EM11023 | 1 | 1002 | 6 | 0.30901 | 1003 | 6 | 0.57778 | | EM11028 |
| 971- | MPC | 1 | 4 | 1 | -1.00000 | 1001 | 1 | 1.00000 | | EM11029 |
| 972- | EM11024 | 1 | 1002 | 2 | 2.00000 | 1003 | 2 | 0.00000 | | EM11030 |
| 973- | MPC | 1 | 4 | 2 | -1.00000 | 1001 | 2 | 1.00000 | | EM11031 |
| 974- | EM11025 | 1 | 1002 | 3 | 0.95105 | 1003 | 3 | 0.80901 | | EM11032 |
| 975- | MPC | 1 | 4 | 3 | -1.00000 | 1001 | 3 | 0.00000 | | EM11033 |
| 976- | EM11026 | 1 | 1002 | 4 | 1.00000 | 1003 | 4 | 0.00000 | | EM11034 |
| 977- | MPC | 1 | 4 | 4 | -1.00000 | 1001 | 4 | 0.95105 | | EM11035 |
| 978- | EM11027 | 1 | 1002 | 5 | 0.30901 | 1003 | 5 | 0.57778 | | EM11036 |
| 979- | MPC | 1 | 4 | 5 | -1.00000 | 1001 | 5 | 1.00000 | | EM11037 |
| 980- | EM11028 | 1 | 1002 | 6 | 1.00000 | 1003 | 6 | 0.00000 | | EM11038 |
| 981- | MPC | 1 | 4 | 6 | -1.00000 | 1001 | 6 | 0.95105 | | EM11039 |
| 982- | EM11029 | 1 | 1002 | 1 | 0.80901 | 1003 | 1 | 1.00000 | | EM11040 |
| 983- | MPC | 1 | 4 | 2 | -1.00000 | 1001 | 2 | 0.00000 | | EM11041 |
| 984- | EM11030 | 1 | 1002 | 3 | 2.00000 | 1003 | 3 | 0.30901 | | EM11042 |
| 985- | MPC | 1 | 4 | 3 | -1.00000 | 1001 | 3 | 0.57778 | | EM11043 |
| 986- | EM11031 | 1 | 1002 | 4 | 0.57778 | 1003 | 4 | 0.95105 | | EM11044 |
| 987- | MPC | 1 | 4 | 4 | -1.00000 | 1001 | 4 | 1.00000 | | EM11045 |
| 988- | EM11032 | 1 | 1002 | 5 | 0.30901 | 1003 | 5 | 0.30901 | | EM11046 |
| 989- | MPC | 1 | 4 | 5 | -1.00000 | 1001 | 5 | 0.00000 | | EM11047 |
| 990- | EM11033 | 1 | 1002 | 6 | 0.57778 | 1003 | 6 | 0.95105 | | EM11048 |
| 991- | MPC | 1 | 4 | 6 | -1.00000 | 1001 | 6 | 1.00000 | | EM11049 |
| 992- | EM11034 | 1 | 1002 | 1 | 0.80901 | 1003 | 1 | 0.00000 | | EM11050 |
| 993- | MPC | 1 | 4 | 2 | -1.00000 | 1001 | 2 | 0.00000 | | EM11051 |
| 994- | EM11035 | 1 | 1002 | 3 | 2.00000 | 1003 | 3 | 0.30901 | | EM11052 |
| 995- | MPC | 1 | 4 | 3 | -1.00000 | 1001 | 3 | 0.57778 | | EM11053 |
| 996- | EM11036 | 1 | 1002 | 4 | 0.57778 | 1003 | 4 | 0.95105 | | EM11054 |
| 997- | MPC | 1 | 4 | 4 | -1.00000 | 1001 | 4 | 1.00000 | | EM11055 |
| 998- | EM11037 | 1 | 1002 | 5 | 0.30901 | 1003 | 5 | 0.30901 | | EM11056 |
| 999- | MPC | 1 | 4 | 5 | -1.00000 | 1001 | 5 | 0.00000 | | EM11057 |
| 1000- | EM11038 | 1 | 1002 | 6 | 0.57778 | 1003 | 6 | 0.95105 | | EM11058 |

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AXISYMMETRIC CIRC. CYL. WITH FLUID
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SORTED BULK DATA ECHO

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---------|---|------|---|--------------|---|---------|-----------|---------|---------|
| COUNT | 1 | 6 | 1002 | 1 | -1.000001001 | 1 | 1.00000 | 1-0.89901 | 1.00000 | CM11051 |
| 1001- | CM11051 | | | | | | | | | |
| 1002- | CM11051 | | | | | | | | | |
| 1003- | CM11052 | | | | | | | | | CM11052 |
| 1004- | CM11052 | | | | | | | | | |
| 1005- | CM11052 | | | | | | | | | CM11053 |
| 1006- | CM11053 | | | | | | | | | |
| 1007- | CM11053 | | | | | | | | | CM11054 |
| 1008- | CM11054 | | | | | | | | | |
| 1009- | CM11054 | | | | | | | | | CM11055 |
| 1010- | CM11055 | | | | | | | | | |
| 1011- | CM11055 | | | | | | | | | CM11056 |
| 1012- | CM11056 | | | | | | | | | |
| 1013- | CM11056 | | | | | | | | | CM11061 |
| 1014- | CM11061 | | | | | | | | | |
| 1015- | CM11061 | | | | | | | | | CM11062 |
| 1016- | CM11062 | | | | | | | | | |
| 1017- | CM11062 | | | | | | | | | CM11063 |
| 1018- | CM11063 | | | | | | | | | |
| 1019- | CM11063 | | | | | | | | | CM11064 |
| 1020- | CM11064 | | | | | | | | | |
| 1021- | CM11064 | | | | | | | | | CM11065 |
| 1022- | CM11065 | | | | | | | | | |
| 1023- | CM11065 | | | | | | | | | CM11066 |
| 1024- | CM11066 | | | | | | | | | |
| 1025- | CM11066 | | | | | | | | | CM11071 |
| 1026- | CM11071 | | | | | | | | | |
| 1027- | CM11071 | | | | | | | | | CM11072 |
| 1028- | CM11072 | | | | | | | | | |
| 1029- | CM11072 | | | | | | | | | CM11073 |
| 1030- | CM11073 | | | | | | | | | |
| 1031- | CM11073 | | | | | | | | | CM11074 |
| 1032- | CM11074 | | | | | | | | | |
| 1033- | CM11074 | | | | | | | | | CM11075 |
| 1034- | CM11075 | | | | | | | | | |
| 1035- | CM11075 | | | | | | | | | CM11076 |
| 1036- | CM11076 | | | | | | | | | |
| 1037- | CM11076 | | | | | | | | | CM11081 |
| 1038- | CM11081 | | | | | | | | | |
| 1039- | CM11081 | | | | | | | | | CM11082 |
| 1040- | CM11082 | | | | | | | | | |
| 1041- | CM11082 | | | | | | | | | CM11083 |
| 1042- | CM11083 | | | | | | | | | |
| 1043- | CM11083 | | | | | | | | | CM11084 |
| 1044- | CM11084 | | | | | | | | | |
| 1045- | CM11084 | | | | | | | | | CM11085 |
| 1046- | CM11085 | | | | | | | | | |
| 1047- | CM11085 | | | | | | | | | CM11086 |
| 1048- | CM11086 | | | | | | | | | |
| 1049- | CM11086 | | | | | | | | | CM11091 |
| 1050- | CM11091 | | | | | | | | | |

ORIGINAL PAGE IS
OF POOR QUALITY

AXISymmetric C CIRC. CYL. WITH FLUID

HARMONIC REDUCTION

APRIL 11, 1974 NASTRAN 5/13/72

SORTED BULK DATA ECHO

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---|----|------|---|--------------|------|-----------|-----------|---------|----|
| 1051- | 1 | 10 | 1002 | 2 | -1.000001001 | 2 | .00000 | 2-0.95105 | 2MI1092 | |
| 1052- | 1 | 10 | 1002 | 3 | 2 0.58778 | 1003 | 1.00000 | 3 0.30901 | 2MI1093 | |
| 1053- | 1 | 10 | 1002 | 4 | -1.000001001 | 1003 | .00000 | 4-0.95105 | 2MI1094 | |
| 1054- | 1 | 10 | 1002 | 5 | 4 0.58778 | 1003 | 1.00000 | 5 0.30901 | 2MI1095 | |
| 1055- | 1 | 10 | 1002 | 6 | -1.000001001 | 1003 | .00000 | 6-0.95105 | 2MI1096 | |
| 1056- | 1 | 10 | 1002 | 1 | -1.000001001 | 1003 | 1.00000 | 1 0.00000 | 2MI1101 | |
| 1057- | 1 | 10 | 1002 | 2 | 1-0.95105 | 1003 | 1.00000 | 2 0.00000 | 2MI1102 | |
| 1058- | 1 | 10 | 1002 | 3 | 2 0.30901 | 1003 | 2-0.58778 | 3 1.00000 | 2MI1103 | |
| 1059- | 1 | 10 | 1002 | 4 | -1.000001001 | 1003 | .00000 | 4-0.95105 | 2MI1104 | |
| 1060- | 1 | 10 | 1002 | 5 | 4 0.58778 | 1003 | 1.00000 | 5 0.30901 | 2MI1105 | |
| 1061- | 1 | 10 | 1002 | 6 | -1.000001001 | 1003 | .00000 | 6-0.95105 | 2MI1106 | |
| 1062- | 1 | 11 | 1002 | 1 | -1.000001001 | 1003 | 1.00000 | 1 0.00000 | 2MI1111 | |
| 1063- | 1 | 11 | 1002 | 2 | 1-0.95105 | 1003 | 1.00000 | 2 0.00000 | 2MI1112 | |
| 1064- | 1 | 11 | 1002 | 3 | 2 0.30901 | 1003 | 2-0.58778 | 3 1.00000 | 2MI1113 | |
| 1065- | 1 | 11 | 1002 | 4 | -1.000001001 | 1003 | .00000 | 4-0.95105 | 2MI1114 | |
| 1066- | 1 | 11 | 1002 | 5 | 4 0.58778 | 1003 | 1.00000 | 5 0.30901 | 2MI1115 | |
| 1067- | 1 | 11 | 1002 | 6 | -1.000001001 | 1003 | .00000 | 6-0.95105 | 2MI1116 | |
| 1068- | 1 | 11 | 1002 | 1 | -1.000001001 | 1003 | 1.00000 | 1 0.00000 | 2MI1201 | |
| 1069- | 1 | 11 | 1002 | 2 | 1-0.95105 | 1003 | 1.00000 | 2 0.00000 | 2MI1202 | |
| 1070- | 1 | 11 | 1002 | 3 | 2 0.30901 | 1003 | 2-0.58778 | 3 1.00000 | 2MI1203 | |
| 1071- | 1 | 11 | 1002 | 4 | -1.000001001 | 1003 | .00000 | 4-0.95105 | 2MI1204 | |
| 1072- | 1 | 11 | 1002 | 5 | 4 0.58778 | 1003 | 1.00000 | 5 0.30901 | 2MI1205 | |
| 1073- | 1 | 11 | 1002 | 6 | -1.000001001 | 1003 | .00000 | 6-0.95105 | 2MI1206 | |
| 1074- | 1 | 12 | 1002 | 1 | -1.000001001 | 1003 | 1.00000 | 1 0.00000 | 2MI1207 | |
| 1075- | 1 | 12 | 1002 | 2 | 1-0.95105 | 1003 | 1.00000 | 2 0.00000 | 2MI1208 | |
| 1076- | 1 | 12 | 1002 | 3 | 2 0.30901 | 1003 | 2-0.58778 | 3 1.00000 | 2MI1209 | |
| 1077- | 1 | 12 | 1002 | 4 | -1.000001001 | 1003 | .00000 | 4-0.95105 | 2MI1210 | |
| 1078- | 1 | 12 | 1002 | 5 | 4 0.58778 | 1003 | 1.00000 | 5 0.30901 | 2MI1211 | |
| 1079- | 1 | 12 | 1002 | 6 | -1.000001001 | 1003 | .00000 | 6-0.95105 | 2MI1212 | |
| 1080- | 1 | 12 | 1002 | 1 | -1.000001001 | 1003 | 1.00000 | 1 0.00000 | 2MI1213 | |
| 1081- | 1 | 12 | 1002 | 2 | 1-0.95105 | 1003 | 1.00000 | 2 0.00000 | 2MI1214 | |
| 1082- | 1 | 12 | 1002 | 3 | 2 0.30901 | 1003 | 2-0.58778 | 3 1.00000 | 2MI1215 | |
| 1083- | 1 | 12 | 1002 | 4 | -1.000001001 | 1003 | .00000 | 4-0.95105 | 2MI1216 | |
| 1084- | 1 | 12 | 1002 | 5 | 4 0.58778 | 1003 | 1.00000 | 5 0.30901 | 2MI1217 | |
| 1085- | 1 | 12 | 1002 | 6 | -1.000001001 | 1003 | .00000 | 6-0.95105 | 2MI1218 | |
| 1086- | 1 | 13 | 1002 | 1 | -1.000002001 | 1003 | 1.00000 | 1 0.00000 | 2MI1219 | |
| 1087- | 1 | 13 | 1002 | 2 | 1-0.95105 | 1003 | 1.00000 | 2 0.00000 | 2MI1220 | |
| 1088- | 1 | 13 | 1002 | 3 | 2 0.30901 | 1003 | 2-0.58778 | 3 1.00000 | 2MI1221 | |
| 1089- | 1 | 13 | 1002 | 4 | -1.000002001 | 1003 | .00000 | 4-0.95105 | 2MI1222 | |
| 1090- | 1 | 13 | 1002 | 5 | 4 0.58778 | 1003 | 1.00000 | 5 0.30901 | 2MI1223 | |
| 1091- | 1 | 13 | 1002 | 6 | -1.000002001 | 1003 | .00000 | 6-0.95105 | 2MI1224 | |
| 1092- | 1 | 13 | 1002 | 1 | -1.000002001 | 1003 | 1.00000 | 1 0.00000 | 2MI1225 | |
| 1093- | 1 | 13 | 1002 | 2 | 1-0.95105 | 1003 | 1.00000 | 2 0.00000 | 2MI1226 | |
| 1094- | 1 | 13 | 1002 | 3 | 2 0.30901 | 1003 | 2-0.58778 | 3 1.00000 | 2MI1227 | |
| 1095- | 1 | 13 | 1002 | 4 | -1.000002001 | 1003 | .00000 | 4-0.95105 | 2MI1228 | |
| 1096- | 1 | 13 | 1002 | 5 | 4 0.58778 | 1003 | 1.00000 | 5 0.30901 | 2MI1229 | |
| 1097- | 1 | 13 | 1002 | 6 | -1.000002001 | 1003 | .00000 | 6-0.95105 | 2MI1230 | |
| 1098- | 1 | 14 | 1002 | 1 | -1.000002001 | 1003 | 1.00000 | 1 0.00000 | 2MI1231 | |
| 1099- | 1 | 14 | 1002 | 2 | 1-0.95105 | 1003 | 1.00000 | 2 0.00000 | 2MI1232 | |
| 1100- | 1 | 14 | 1002 | 3 | 2 0.30901 | 1003 | 2-0.58778 | 3 1.00000 | 2MI1233 | |

| SORTED BULK DATA EC NO | | | | | | | | | |
|------------------------|---|----|------|---|--------------|------|---------|---|----|
| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 1101-
COUNT | 1 | 14 | 2002 | 3 | -1.000000001 | 3 | 1.00000 | 9 | 10 |
| 1102-
MPC | 1 | 14 | 2002 | 3 | 0.95105 | 2003 | 0.80901 | 9 | 10 |
| 1103-
MPC | 1 | 14 | 2002 | 4 | -1.000000001 | 4 | .00000 | 9 | 10 |
| 1104-
MPC | 1 | 14 | 2002 | 4 | 0.30901 | 2003 | 0.57778 | 9 | 10 |
| 1105-
MPC | 1 | 14 | 2002 | 5 | -1.000000001 | 5 | 1.00000 | 9 | 10 |
| 1106-
MPC | 1 | 14 | 2002 | 5 | 0.95105 | 2003 | 0.80901 | 9 | 10 |
| 1107-
MPC | 1 | 14 | 2002 | 6 | -1.000000001 | 6 | .00000 | 9 | 10 |
| 1108-
MPC | 1 | 14 | 2002 | 6 | 0.30901 | 2003 | 0.57778 | 9 | 10 |
| 1109-
MPC | 1 | 15 | 2002 | 1 | -1.000000001 | 1 | 1.00000 | 9 | 10 |
| 1110-
MPC | 1 | 15 | 2002 | 1 | 0.80901 | 2003 | 0.30901 | 9 | 10 |
| 1111-
MPC | 1 | 15 | 2002 | 2 | -1.000000001 | 2 | .00000 | 9 | 10 |
| 1112-
MPC | 1 | 15 | 2002 | 2 | 0.57778 | 2003 | 0.95105 | 9 | 10 |
| 1113-
MPC | 1 | 15 | 2002 | 3 | -1.000000001 | 3 | 1.00000 | 9 | 10 |
| 1114-
MPC | 1 | 15 | 2002 | 3 | 0.80901 | 2003 | 0.30901 | 9 | 10 |
| 1115-
MPC | 1 | 15 | 2002 | 4 | -1.000000001 | 4 | .00000 | 9 | 10 |
| 1116-
MPC | 1 | 15 | 2002 | 4 | 0.57778 | 2003 | 0.95105 | 9 | 10 |
| 1117-
MPC | 1 | 15 | 2002 | 5 | -1.000000001 | 5 | 1.00000 | 9 | 10 |
| 1118-
MPC | 1 | 15 | 2002 | 5 | 0.80901 | 2003 | 0.30901 | 9 | 10 |
| 1119-
MPC | 1 | 15 | 2002 | 6 | -1.000000001 | 6 | .00000 | 9 | 10 |
| 1120-
MPC | 1 | 15 | 2002 | 6 | 0.57778 | 2003 | 0.95105 | 9 | 10 |
| 1121-
MPC | 1 | 16 | 2002 | 1 | -1.000000001 | 1 | 1.00000 | 9 | 10 |
| 1122-
MPC | 1 | 16 | 2002 | 1 | 0.57778 | 2003 | 1.00000 | 9 | 10 |
| 1123-
MPC | 1 | 16 | 2002 | 2 | -1.000000001 | 2 | .00000 | 9 | 10 |
| 1124-
MPC | 1 | 16 | 2002 | 2 | 0.80901 | 2003 | 0.30901 | 9 | 10 |
| 1125-
MPC | 1 | 16 | 2002 | 3 | -1.000000001 | 3 | 1.00000 | 9 | 10 |
| 1126-
MPC | 1 | 16 | 2002 | 3 | 0.57778 | 2003 | 0.95105 | 9 | 10 |
| 1127-
MPC | 1 | 16 | 2002 | 4 | -1.000000001 | 4 | .00000 | 9 | 10 |
| 1128-
MPC | 1 | 16 | 2002 | 4 | 0.80901 | 2003 | 0.30901 | 9 | 10 |
| 1129-
MPC | 1 | 16 | 2002 | 5 | -1.000000001 | 5 | 1.00000 | 9 | 10 |
| 1130-
MPC | 1 | 16 | 2002 | 5 | 0.57778 | 2003 | 0.95105 | 9 | 10 |
| 1131-
MPC | 1 | 16 | 2002 | 6 | -1.000000001 | 6 | .00000 | 9 | 10 |
| 1132-
MPC | 1 | 16 | 2002 | 6 | 0.80901 | 2003 | 0.30901 | 9 | 10 |
| 1133-
MPC | 1 | 17 | 2002 | 1 | -1.000000001 | 1 | 1.00000 | 9 | 10 |
| 1134-
MPC | 1 | 17 | 2002 | 1 | 0.57778 | 2003 | 1.00000 | 9 | 10 |
| 1135-
MPC | 1 | 17 | 2002 | 2 | -1.000000001 | 2 | .00000 | 9 | 10 |
| 1136-
MPC | 1 | 17 | 2002 | 2 | 0.80901 | 2003 | 0.30901 | 9 | 10 |
| 1137-
MPC | 1 | 17 | 2002 | 3 | -1.000000001 | 3 | 1.00000 | 9 | 10 |
| 1138-
MPC | 1 | 17 | 2002 | 3 | 0.57778 | 2003 | 0.95105 | 9 | 10 |
| 1139-
MPC | 1 | 17 | 2002 | 4 | -1.000000001 | 4 | .00000 | 9 | 10 |
| 1140-
MPC | 1 | 17 | 2002 | 4 | 0.80901 | 2003 | 0.30901 | 9 | 10 |
| 1141-
MPC | 1 | 17 | 2002 | 5 | -1.000000001 | 5 | 1.00000 | 9 | 10 |
| 1142-
MPC | 1 | 17 | 2002 | 5 | 0.57778 | 2003 | 0.95105 | 9 | 10 |
| 1143-
MPC | 1 | 17 | 2002 | 6 | -1.000000001 | 6 | .00000 | 9 | 10 |
| 1144-
MPC | 1 | 17 | 2002 | 6 | 0.80901 | 2003 | 0.30901 | 9 | 10 |
| 1145-
MPC | 1 | 18 | 2002 | 1 | -1.000000001 | 1 | 1.00000 | 9 | 10 |
| 1146-
MPC | 1 | 18 | 2002 | 1 | 0.57778 | 2003 | 0.95105 | 9 | 10 |
| 1147-
MPC | 1 | 18 | 2002 | 2 | -1.000000001 | 2 | .00000 | 9 | 10 |
| 1148-
MPC | 1 | 18 | 2002 | 2 | 0.80901 | 2003 | 0.30901 | 9 | 10 |
| 1149-
MPC | 1 | 18 | 2002 | 3 | -1.000000001 | 3 | 1.00000 | 9 | 10 |
| 1150-
MPC | 1 | 18 | 2002 | 3 | 0.57778 | 2003 | 0.95105 | 9 | 10 |

SORTED BULK DATA ECHO

| CARD
COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------------|---|----|------|---|--------------|------|---------|----------|---|---------|
| 1151-
MPC | 1 | 18 | 4 | 4 | -1.000002001 | 4 | .00000 | | | CM12064 |
| 1152-
MPC | 1 | 18 | 2002 | 5 | 1.00000 | 2003 | 4 | 0.00000 | | CM12065 |
| 1153-
MPC | 1 | 18 | 2002 | 5 | 1.000002001 | 5 | 1.00000 | | | CM12065 |
| 1154-
MPC | 1 | 18 | 2002 | 6 | 5.00000 | 2003 | 5 | -1.00000 | | CM12066 |
| 1155-
MPC | 1 | 18 | 2002 | 6 | -1.000002001 | 6 | .00000 | | | CM12066 |
| 1156-
MPC | 1 | 19 | 2002 | 1 | -1.000002001 | 1 | 1.00000 | | | CM12071 |
| 1157-
MPC | 1 | 19 | 2002 | 2 | 1.000002001 | 2 | 1.00000 | | | CM12072 |
| 1158-
MPC | 1 | 19 | 2002 | 2 | -1.000002001 | 2 | .00000 | | | CM12072 |
| 1159-
MPC | 1 | 19 | 2002 | 2 | 2.000002001 | 2 | 2.00000 | | | CM12073 |
| 1160-
MPC | 1 | 19 | 2002 | 3 | -1.000002001 | 3 | 1.00000 | | | CM12073 |
| 1161-
MPC | 1 | 19 | 2002 | 3 | 3.000002001 | 3 | 3.00000 | | | CM12074 |
| 1162-
MPC | 1 | 19 | 2002 | 4 | -1.000002001 | 4 | .00000 | | | CM12074 |
| 1163-
MPC | 1 | 19 | 2002 | 4 | 0.95105 | 2003 | 4 | 0.58778 | | CM12075 |
| 1164-
MPC | 1 | 19 | 2002 | 5 | -1.000002001 | 5 | 1.00000 | | | CM12075 |
| 1165-
MPC | 1 | 19 | 2002 | 5 | -1.000002001 | 5 | 1.00000 | | | CM12075 |
| 1166-
MPC | 1 | 19 | 2002 | 6 | 5.00000 | 2003 | 5 | -0.80901 | | CM12076 |
| 1167-
MPC | 1 | 19 | 2002 | 6 | -1.000002001 | 6 | .00000 | | | CM12076 |
| 1168-
MPC | 1 | 20 | 2002 | 1 | 6.00000 | 2003 | 6 | 0.58778 | | CM12081 |
| 1169-
MPC | 1 | 20 | 2002 | 1 | -1.000002001 | 1 | 1.00000 | | | CM12081 |
| 1170-
MPC | 1 | 20 | 2002 | 2 | 1.000002001 | 2 | 1.00000 | | | CM12082 |
| 1171-
MPC | 1 | 20 | 2002 | 2 | -1.000002001 | 2 | .00000 | | | CM12082 |
| 1172-
MPC | 1 | 20 | 2002 | 3 | 2.00000 | 2003 | 2 | 0.58778 | | CM12083 |
| 1173-
MPC | 1 | 20 | 2002 | 3 | -1.000002001 | 3 | 1.00000 | | | CM12083 |
| 1174-
MPC | 1 | 20 | 2002 | 4 | 3.00000 | 2003 | 3 | -0.30901 | | CM12084 |
| 1175-
MPC | 1 | 20 | 2002 | 4 | -1.000002001 | 4 | .00000 | | | CM12084 |
| 1176-
MPC | 1 | 20 | 2002 | 5 | 4.00000 | 2003 | 4 | 0.95105 | | CM12085 |
| 1177-
MPC | 1 | 20 | 2002 | 5 | -1.000002001 | 5 | 1.00000 | | | CM12085 |
| 1178-
MPC | 1 | 20 | 2002 | 6 | 5.00000 | 2003 | 5 | -0.30901 | | CM12086 |
| 1179-
MPC | 1 | 20 | 2002 | 6 | -1.000002001 | 6 | .00000 | | | CM12086 |
| 1180-
MPC | 1 | 21 | 2002 | 1 | 1.000002001 | 1 | 1.00000 | | | CM12091 |
| 1181-
MPC | 1 | 21 | 2002 | 1 | -1.000002001 | 1 | 1.00000 | | | CM12091 |
| 1182-
MPC | 1 | 21 | 2002 | 2 | -1.000002001 | 2 | .00000 | | | CM12092 |
| 1183-
MPC | 1 | 21 | 2002 | 2 | 2.00000 | 2003 | 2 | 0.95105 | | CM12093 |
| 1184-
MPC | 1 | 21 | 2002 | 3 | -1.000002001 | 3 | 1.00000 | | | CM12093 |
| 1185-
MPC | 1 | 21 | 2002 | 3 | 3.00000 | 2003 | 3 | 0.30901 | | CM12094 |
| 1186-
MPC | 1 | 21 | 2002 | 4 | -1.000002001 | 4 | .00000 | | | CM12094 |
| 1187-
MPC | 1 | 21 | 2002 | 4 | 4.00000 | 2003 | 4 | 0.95105 | | CM12095 |
| 1188-
MPC | 1 | 21 | 2002 | 5 | -1.000002001 | 5 | 1.00000 | | | CM12095 |
| 1189-
MPC | 1 | 21 | 2002 | 5 | 5.00000 | 2003 | 5 | 0.30901 | | CM12096 |
| 1190-
MPC | 1 | 21 | 2002 | 6 | -1.000002001 | 6 | .00000 | | | CM12096 |
| 1191-
MPC | 1 | 22 | 2002 | 1 | 6.00000 | 2003 | 6 | 0.58778 | | CM12101 |
| 1192-
MPC | 1 | 22 | 2002 | 1 | -1.000002001 | 1 | 1.00000 | | | CM12101 |
| 1193-
MPC | 1 | 22 | 2002 | 2 | 1.000002001 | 2 | 1.00000 | | | CM12102 |
| 1194-
MPC | 1 | 22 | 2002 | 2 | -1.000002001 | 2 | .00000 | | | CM12102 |
| 1195-
MPC | 1 | 22 | 2002 | 3 | 2.00000 | 2003 | 3 | 0.58778 | | CM12103 |
| 1196-
MPC | 1 | 22 | 2002 | 3 | -1.000002001 | 3 | 1.00000 | | | CM12103 |
| 1197-
MPC | 1 | 22 | 2002 | 4 | 3.00000 | 2003 | 4 | 0.30901 | | CM12104 |
| 1198-
MPC | 1 | 22 | 2002 | 4 | -1.000002001 | 4 | .00000 | | | CM12104 |
| 1199-
MPC | 1 | 22 | 2002 | 4 | 4.00000 | 2003 | 4 | 0.58778 | | CM12104 |

SORTED BULK DATA ECHO

| CARD | COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|-------|---|----|------|---|--------------|------|---------|---------|---|---------|
| 1201- | 1 | 1 | 22 | 2002 | 5 | -1.000000001 | 5 | 1.00000 | | | EMI2105 |
| 1202- | 1 | 1 | 22 | 2002 | 6 | 5-0.95105 | 2003 | 6 | 0.00000 | | EMI2106 |
| 1203- | 1 | 1 | 22 | 2002 | 6 | -1.000000001 | 2003 | 6 | 0.00000 | | EMI2106 |
| 1204- | 1 | 1 | 23 | 2002 | 1 | -1.000000001 | 2003 | 1 | 1.00000 | | EMI2111 |
| 1205- | 1 | 1 | 23 | 2002 | 2 | -1.000000001 | 2003 | 2 | 1.00000 | | EMI2112 |
| 1206- | 1 | 1 | 23 | 2002 | 3 | -1.000000001 | 2003 | 3 | 1.00000 | | EMI2113 |
| 1207- | 1 | 1 | 23 | 2002 | 4 | -1.000000001 | 2003 | 4 | 0.00000 | | EMI2114 |
| 1208- | 1 | 1 | 23 | 2002 | 5 | -1.000000001 | 2003 | 5 | 1.00000 | | EMI2115 |
| 1209- | 1 | 1 | 23 | 2002 | 6 | -1.000000001 | 2003 | 6 | 0.00000 | | EMI2116 |
| 1210- | 1 | 1 | 24 | 3002 | 1 | -1.000000001 | 3003 | 1 | 1.00000 | | EMI3011 |
| 1211- | 1 | 1 | 24 | 3002 | 2 | -1.000000001 | 3003 | 2 | 0.00000 | | EMI3012 |
| 1212- | 1 | 1 | 24 | 3002 | 3 | -1.000000001 | 3003 | 3 | 1.00000 | | EMI3013 |
| 1213- | 1 | 1 | 24 | 3002 | 4 | -1.000000001 | 3003 | 4 | 0.00000 | | EMI3014 |
| 1214- | 1 | 1 | 24 | 3002 | 5 | -1.000000001 | 3003 | 5 | 1.00000 | | EMI3015 |
| 1215- | 1 | 1 | 24 | 3002 | 6 | -1.000000001 | 3003 | 6 | 0.00000 | | EMI3016 |
| 1216- | 1 | 1 | 25 | 3002 | 1 | -1.000000001 | 3003 | 1 | 1.00000 | | EMI3021 |
| 1217- | 1 | 1 | 25 | 3002 | 2 | -1.000000001 | 3003 | 2 | 0.00000 | | EMI3022 |
| 1218- | 1 | 1 | 25 | 3002 | 3 | -1.000000001 | 3003 | 3 | 1.00000 | | EMI3023 |
| 1219- | 1 | 1 | 25 | 3002 | 4 | -1.000000001 | 3003 | 4 | 0.00000 | | EMI3024 |
| 1220- | 1 | 1 | 25 | 3002 | 5 | -1.000000001 | 3003 | 5 | 1.00000 | | EMI3025 |
| 1221- | 1 | 1 | 25 | 3002 | 6 | -1.000000001 | 3003 | 6 | 0.00000 | | EMI3026 |
| 1222- | 1 | 1 | 26 | 3002 | 1 | -1.000000001 | 3003 | 1 | 1.00000 | | EMI3031 |
| 1223- | 1 | 1 | 26 | 3002 | 2 | -1.000000001 | 3003 | 2 | 0.00000 | | EMI3032 |
| 1224- | 1 | 1 | 26 | 3002 | 3 | -1.000000001 | 3003 | 3 | 1.00000 | | EMI3033 |
| 1225- | 1 | 1 | 26 | 3002 | 4 | -1.000000001 | 3003 | 4 | 0.00000 | | EMI3034 |
| 1226- | 1 | 1 | 26 | 3002 | 5 | -1.000000001 | 3003 | 5 | 1.00000 | | EMI3035 |
| 1227- | 1 | 1 | 26 | 3002 | 6 | -1.000000001 | 3003 | 6 | 0.00000 | | EMI3035 |
| 1228- | 1 | 1 | 26 | 3002 | 1 | -1.000000001 | 3003 | 1 | 1.00000 | | EMI3035 |
| 1229- | 1 | 1 | 26 | 3002 | 2 | -1.000000001 | 3003 | 2 | 0.00000 | | EMI3035 |
| 1230- | 1 | 1 | 26 | 3002 | 3 | -1.000000001 | 3003 | 3 | 1.00000 | | EMI3035 |
| 1231- | 1 | 1 | 26 | 3002 | 4 | -1.000000001 | 3003 | 4 | 0.00000 | | EMI3035 |
| 1232- | 1 | 1 | 26 | 3002 | 5 | -1.000000001 | 3003 | 5 | 1.00000 | | EMI3035 |
| 1233- | 1 | 1 | 26 | 3002 | 6 | -1.000000001 | 3003 | 6 | 0.00000 | | EMI3035 |
| 1234- | 1 | 1 | 26 | 3002 | 1 | -1.000000001 | 3003 | 1 | 1.00000 | | EMI3035 |
| 1235- | 1 | 1 | 26 | 3002 | 2 | -1.000000001 | 3003 | 2 | 0.00000 | | EMI3035 |
| 1236- | 1 | 1 | 26 | 3002 | 3 | -1.000000001 | 3003 | 3 | 1.00000 | | EMI3035 |
| 1237- | 1 | 1 | 26 | 3002 | 4 | -1.000000001 | 3003 | 4 | 0.00000 | | EMI3035 |
| 1238- | 1 | 1 | 26 | 3002 | 5 | -1.000000001 | 3003 | 5 | 1.00000 | | EMI3035 |
| 1239- | 1 | 1 | 26 | 3002 | 6 | -1.000000001 | 3003 | 6 | 0.00000 | | EMI3035 |
| 1240- | 1 | 1 | 26 | 3002 | 1 | -1.000000001 | 3003 | 1 | 1.00000 | | EMI3035 |
| 1241- | 1 | 1 | 26 | 3002 | 2 | -1.000000001 | 3003 | 2 | 0.00000 | | EMI3035 |
| 1242- | 1 | 1 | 26 | 3002 | 3 | -1.000000001 | 3003 | 3 | 1.00000 | | EMI3035 |
| 1243- | 1 | 1 | 26 | 3002 | 4 | -1.000000001 | 3003 | 4 | 0.00000 | | EMI3035 |
| 1244- | 1 | 1 | 26 | 3002 | 5 | -1.000000001 | 3003 | 5 | 1.00000 | | EMI3035 |
| 1245- | 1 | 1 | 26 | 3002 | 6 | -1.000000001 | 3003 | 6 | 0.00000 | | EMI3035 |
| 1246- | 1 | 1 | 26 | 3002 | 1 | -1.000000001 | 3003 | 1 | 1.00000 | | EMI3035 |
| 1247- | 1 | 1 | 26 | 3002 | 2 | -1.000000001 | 3003 | 2 | 0.00000 | | EMI3035 |
| 1248- | 1 | 1 | 26 | 3002 | 3 | -1.000000001 | 3003 | 3 | 1.00000 | | EMI3035 |
| 1249- | 1 | 1 | 26 | 3002 | 4 | -1.000000001 | 3003 | 4 | 0.00000 | | EMI3035 |
| 1250- | 1 | 1 | 26 | 3002 | 5 | -1.000000001 | 3003 | 5 | 1.00000 | | EMI3035 |

ORIGINAL PAGE IS
OF POOR QUALITY

AXISYMM C CIRC. CYL. WITH FLUID
HARMONIC REDUCTION

APRIL 11, 1974 NASTRAN 5/13/72

SORTED BULK DATA ECHO

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---------|----|------|---|-------------|------|---|------------|---|---------|
| COUNT | 1 | 26 | 3002 | 6 | 1.00000000 | 3003 | 6 | .00000 | | EMI3036 |
| 1251- | MP | | | | -1.00000000 | 3003 | | 4 0.55105 | | |
| 1252- | EMI3036 | | 3002 | 1 | 6 0.58778 | 3003 | | 1 0.00000 | | EMI3041 |
| 1253- | MP | | | | -1.00000000 | 3003 | | 1 0.00000 | | |
| 1254- | EMI3041 | | 3002 | 2 | 1 0.58778 | 3003 | | 2 0.00000 | | EMI3042 |
| 1255- | MP | | | | -1.00000000 | 3003 | | 2 0.95105 | | |
| 1256- | EMI3042 | | 3002 | 3 | 2 0.80901 | 3003 | | 3 1.00000 | | EMI3043 |
| 1257- | MP | | | | -1.00000000 | 3003 | | 4 0.00000 | | |
| 1258- | EMI3043 | | 3002 | 4 | 3 0.58778 | 3003 | | 4 0.95105 | | EMI3044 |
| 1259- | MP | | | | -1.00000000 | 3003 | | 5 1.00000 | | |
| 1260- | EMI3044 | | 3002 | 5 | 4 0.50901 | 3003 | | 5 0.00000 | | EMI3045 |
| 1261- | MP | | | | -1.00000000 | 3003 | | 6 0.00000 | | |
| 1262- | EMI3045 | | 3002 | 6 | 5 0.58778 | 3003 | | 6 0.95105 | | EMI3046 |
| 1263- | MP | | | | -1.00000000 | 3003 | | 1 0.00000 | | |
| 1264- | EMI3046 | | 3002 | 1 | 6 0.00000 | 3003 | | 1 0.00000 | | EMI3051 |
| 1265- | MP | | | | -1.00000000 | 3003 | | 2 0.00000 | | |
| 1266- | EMI3051 | | 3002 | 2 | 1 0.30901 | 3003 | | 3 0.00000 | | EMI3052 |
| 1267- | MP | | | | -1.00000000 | 3003 | | 4 0.58778 | | |
| 1268- | EMI3052 | | 3002 | 3 | 2 0.95105 | 3003 | | 5 1.00000 | | EMI3053 |
| 1269- | MP | | | | -1.00000000 | 3003 | | 6 0.00000 | | |
| 1270- | EMI3053 | | 3002 | 4 | 3 0.30901 | 3003 | | 7 0.00000 | | EMI3054 |
| 1271- | MP | | | | -1.00000000 | 3003 | | 8 0.58778 | | |
| 1272- | EMI3054 | | 3002 | 5 | 4 0.95105 | 3003 | | 9 1.00000 | | EMI3055 |
| 1273- | MP | | | | -1.00000000 | 3003 | | 10 0.00000 | | |
| 1274- | EMI3055 | | 3002 | 6 | 5 0.30901 | 3003 | | 11 0.00000 | | EMI3056 |
| 1275- | MP | | | | -1.00000000 | 3003 | | 12 0.58778 | | |
| 1276- | EMI3056 | | 3002 | 1 | 6 0.95105 | 3003 | | 13 1.00000 | | EMI3061 |
| 1277- | MP | | | | -1.00000000 | 3003 | | 14 0.00000 | | |
| 1278- | EMI3061 | | 3002 | 2 | 1 0.00000 | 3003 | | 15 0.00000 | | EMI3062 |
| 1279- | MP | | | | -1.00000000 | 3003 | | 16 0.00000 | | |
| 1280- | EMI3062 | | 3002 | 3 | 2 1.00000 | 3003 | | 17 1.00000 | | EMI3063 |
| 1281- | MP | | | | -1.00000000 | 3003 | | 18 0.00000 | | |
| 1282- | EMI3063 | | 3002 | 4 | 3 0.00000 | 3003 | | 19 0.00000 | | EMI3064 |
| 1283- | MP | | | | -1.00000000 | 3003 | | 20 0.00000 | | |
| 1284- | EMI3064 | | 3002 | 5 | 4 1.00000 | 3003 | | 21 0.00000 | | EMI3065 |
| 1285- | MP | | | | -1.00000000 | 3003 | | 22 1.00000 | | |
| 1286- | EMI3065 | | 3002 | 6 | 5 0.00000 | 3003 | | 23 0.00000 | | EMI3066 |
| 1287- | MP | | | | -1.00000000 | 3003 | | 24 0.00000 | | |
| 1288- | EMI3066 | | 3002 | 1 | 6 1.00000 | 3003 | | 25 0.00000 | | EMI3071 |
| 1289- | MP | | | | -1.00000000 | 3003 | | 26 1.00000 | | |
| 1290- | EMI3071 | | 3002 | 2 | 1 0.30901 | 3003 | | 27 1.00000 | | EMI3072 |
| 1291- | MP | | | | -1.00000000 | 3003 | | 28 0.00000 | | |
| 1292- | EMI3072 | | 3002 | 3 | 2 0.95105 | 3003 | | 29 0.58778 | | EMI3073 |
| 1293- | MP | | | | -1.00000000 | 3003 | | 30 1.00000 | | |
| 1294- | EMI3073 | | 3002 | 4 | 3 0.30901 | 3003 | | 31 0.00000 | | EMI3074 |
| 1295- | MP | | | | -1.00000000 | 3003 | | 32 0.00000 | | |
| 1296- | EMI3074 | | 3002 | 5 | 4 0.95105 | 3003 | | 33 0.58778 | | EMI3075 |
| 1297- | MP | | | | -1.00000000 | 3003 | | 34 1.00000 | | |
| 1298- | EMI3075 | | 3002 | 6 | 5 0.30901 | 3003 | | 35 0.00000 | | EMI3076 |
| 1299- | MP | | | | -1.00000000 | 3003 | | 36 0.00000 | | |
| 1300- | EMI3076 | | 3002 | | 6 0.55105 | 3003 | | 37 0.58778 | | |

SORTED BULK DATA ECHO

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---------|----|------|---|--------------|------|---------|---------|----|----|
| COUNT | 1 | 31 | 3002 | 1 | -1.000003001 | 1 | 1.00000 | 9 | .. | 10 |
| 1301- | MPC | 1 | 3002 | 1 | -1.000003001 | 1 | 1.00000 | 9 | .. | 10 |
| 1302- | EMI3081 | 1 | 3002 | 1 | -1.000003001 | 1 | 1.00000 | 9 | .. | 10 |
| 1303- | MPC | 1 | 3002 | 2 | -1.000003001 | 2 | 1.00000 | 9 | .. | 10 |
| 1304- | EMI3082 | 1 | 3002 | 2 | -1.000003001 | 2 | 1.00000 | 9 | .. | 10 |
| 1305- | MPC | 1 | 3002 | 3 | -1.000003001 | 3 | 1.00000 | 9 | .. | 10 |
| 1306- | EMI3083 | 1 | 3002 | 3 | -1.000003001 | 3 | 1.00000 | 9 | .. | 10 |
| 1307- | MPC | 1 | 3002 | 4 | -1.000003001 | 4 | 1.00000 | 9 | .. | 10 |
| 1308- | EMI3084 | 1 | 3002 | 4 | -1.000003001 | 4 | 1.00000 | 9 | .. | 10 |
| 1309- | MPC | 1 | 3002 | 5 | -1.000003001 | 5 | 1.00000 | 9 | .. | 10 |
| 1310- | EMI3085 | 1 | 3002 | 5 | -1.000003001 | 5 | 1.00000 | 9 | .. | 10 |
| 1311- | MPC | 1 | 3002 | 6 | -1.000003001 | 6 | 1.00000 | 9 | .. | 10 |
| 1312- | EMI3086 | 1 | 3002 | 6 | -1.000003001 | 6 | 1.00000 | 9 | .. | 10 |
| 1313- | MPC | 1 | 3002 | 1 | -1.000003001 | 1 | 1.00000 | 9 | .. | 10 |
| 1314- | EMI3091 | 1 | 3002 | 1 | -1.000003001 | 1 | 1.00000 | 9 | .. | 10 |
| 1315- | MPC | 1 | 3002 | 2 | -1.000003001 | 2 | 1.00000 | 9 | .. | 10 |
| 1316- | EMI3092 | 1 | 3002 | 2 | -1.000003001 | 2 | 1.00000 | 9 | .. | 10 |
| 1317- | MPC | 1 | 3002 | 3 | -1.000003001 | 3 | 1.00000 | 9 | .. | 10 |
| 1318- | EMI3093 | 1 | 3002 | 3 | -1.000003001 | 3 | 1.00000 | 9 | .. | 10 |
| 1319- | MPC | 1 | 3002 | 4 | -1.000003001 | 4 | 1.00000 | 9 | .. | 10 |
| 1320- | EMI3094 | 1 | 3002 | 4 | -1.000003001 | 4 | 1.00000 | 9 | .. | 10 |
| 1321- | MPC | 1 | 3002 | 5 | -1.000003001 | 5 | 1.00000 | 9 | .. | 10 |
| 1322- | EMI3095 | 1 | 3002 | 5 | -1.000003001 | 5 | 1.00000 | 9 | .. | 10 |
| 1323- | MPC | 1 | 3002 | 6 | -1.000003001 | 6 | 1.00000 | 9 | .. | 10 |
| 1324- | EMI3096 | 1 | 3002 | 6 | -1.000003001 | 6 | 1.00000 | 9 | .. | 10 |
| 1325- | MPC | 1 | 3002 | 1 | -1.000003001 | 1 | 1.00000 | 9 | .. | 10 |
| 1326- | EMI3101 | 1 | 3002 | 1 | -1.000003001 | 1 | 1.00000 | 9 | .. | 10 |
| 1327- | MPC | 1 | 3002 | 2 | -1.000003001 | 2 | 1.00000 | 9 | .. | 10 |
| 1328- | EMI3102 | 1 | 3002 | 2 | -1.000003001 | 2 | 1.00000 | 9 | .. | 10 |
| 1329- | MPC | 1 | 3002 | 3 | -1.000003001 | 3 | 1.00000 | 9 | .. | 10 |
| 1330- | EMI3103 | 1 | 3002 | 3 | -1.000003001 | 3 | 1.00000 | 9 | .. | 10 |
| 1331- | MPC | 1 | 3002 | 4 | -1.000003001 | 4 | 1.00000 | 9 | .. | 10 |
| 1332- | EMI3104 | 1 | 3002 | 4 | -1.000003001 | 4 | 1.00000 | 9 | .. | 10 |
| 1333- | MPC | 1 | 3002 | 5 | -1.000003001 | 5 | 1.00000 | 9 | .. | 10 |
| 1334- | EMI3105 | 1 | 3002 | 5 | -1.000003001 | 5 | 1.00000 | 9 | .. | 10 |
| 1335- | MPC | 1 | 3002 | 6 | -1.000003001 | 6 | 1.00000 | 9 | .. | 10 |
| 1336- | EMI3106 | 1 | 3002 | 6 | -1.000003001 | 6 | 1.00000 | 9 | .. | 10 |
| 1337- | MPC | 1 | 3002 | 1 | -1.000003001 | 1 | 1.00000 | 9 | .. | 10 |
| 1338- | EMI3111 | 1 | 3002 | 1 | -1.000003001 | 1 | 1.00000 | 9 | .. | 10 |
| 1339- | MPC | 1 | 3002 | 2 | -1.000003001 | 2 | 1.00000 | 9 | .. | 10 |
| 1340- | EMI3112 | 1 | 3002 | 2 | -1.000003001 | 2 | 1.00000 | 9 | .. | 10 |
| 1341- | MPC | 1 | 3002 | 3 | -1.000003001 | 3 | 1.00000 | 9 | .. | 10 |
| 1342- | EMI3113 | 1 | 3002 | 3 | -1.000003001 | 3 | 1.00000 | 9 | .. | 10 |
| 1343- | MPC | 1 | 3002 | 4 | -1.000003001 | 4 | 1.00000 | 9 | .. | 10 |
| 1344- | EMI3114 | 1 | 3002 | 4 | -1.000003001 | 4 | 1.00000 | 9 | .. | 10 |
| 1345- | MPC | 1 | 3002 | 5 | -1.000003001 | 5 | 1.00000 | 9 | .. | 10 |
| 1346- | EMI3115 | 1 | 3002 | 5 | -1.000003001 | 5 | 1.00000 | 9 | .. | 10 |
| 1347- | MPC | 1 | 3002 | 6 | -1.000003001 | 6 | 1.00000 | 9 | .. | 10 |
| 1348- | EMI3116 | 1 | 3002 | 6 | -1.000003001 | 6 | 1.00000 | 9 | .. | 10 |
| 1349- | MPC | 1 | 3002 | 1 | -1.000003001 | 1 | 1.00000 | 9 | .. | 10 |
| 1350- | EMI4011 | 1 | 4002 | 1 | 1.00000 | 4003 | 1 | 1.00000 | 9 | .. |

APRIL 11, 1974 NASTRAN 5/13/72

AXISYMMETRIC CIRC. CYL. WITH FLUID
HARMONIC REDUCTION

Sorteo Bulk Data Echo

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---|----|------|----------|---------|------|---|---------|---------|---------|
| 1351- | 1 | 35 | 2 | -1.00000 | 4001 | 2 | | .00000 | | EMI4012 |
| 1352- | | | 4002 | 2 | 0.00000 | 4003 | | 2 | 0.00000 | |
| 1353- | 1 | 35 | 3 | -1.00000 | 4001 | 3 | | 1.00000 | | EMI4013 |
| 1354- | | | 4002 | 3 | 1.00000 | 4003 | | 3 | 1.00000 | |
| 1355- | 1 | 35 | 4 | -1.00000 | 4001 | 4 | | .00000 | | EMI4014 |
| 1356- | | | 4002 | 4 | 0.00000 | 4003 | | 4 | 0.00000 | |
| 1357- | 1 | 35 | 5 | -1.00000 | 4001 | 5 | | 1.00000 | | EMI4015 |
| 1358- | | | 4002 | 5 | 1.00000 | 4003 | | 5 | 1.00000 | |
| 1359- | 1 | 35 | 6 | -1.00000 | 4001 | 6 | | .00000 | | EMI4016 |
| 1360- | | | 4002 | 6 | 0.00000 | 4003 | | 6 | 0.00000 | |
| 1361- | 1 | 36 | 1 | -1.00000 | 4001 | 1 | | 1.00000 | | EMI4021 |
| 1362- | | | 4002 | 1 | 0.95105 | 4003 | | 1 | 0.80901 | |
| 1363- | 1 | 36 | 2 | -1.00000 | 4001 | 2 | | .00000 | | EMI4022 |
| 1364- | | | 4002 | 2 | 0.30901 | 4003 | | 2 | 0.58778 | |
| 1365- | 1 | 36 | 3 | -1.00000 | 4001 | 3 | | 1.00000 | | EMI4023 |
| 1366- | | | 4002 | 3 | 0.95105 | 4003 | | 3 | 0.80901 | |
| 1367- | 1 | 36 | 4 | -1.00000 | 4001 | 4 | | .00000 | | EMI4024 |
| 1368- | | | 4002 | 4 | 0.30901 | 4003 | | 4 | 0.58778 | |
| 1369- | 1 | 36 | 5 | -1.00000 | 4001 | 5 | | 1.00000 | | EMI4025 |
| 1370- | | | 4002 | 5 | 0.95105 | 4003 | | 5 | 0.80901 | |
| 1371- | 1 | 36 | 6 | -1.00000 | 4001 | 6 | | .00000 | | EMI4026 |
| 1372- | | | 4002 | 6 | 0.30901 | 4003 | | 6 | 0.58778 | |
| 1373- | 1 | 37 | 1 | -1.00000 | 4001 | 1 | | 1.00000 | | EMI4031 |
| 1374- | | | 4002 | 1 | 0.80901 | 4003 | | 1 | 0.30901 | |
| 1375- | 1 | 37 | 2 | -1.00000 | 4001 | 2 | | .00000 | | EMI4032 |
| 1376- | | | 4002 | 2 | 0.58778 | 4003 | | 2 | 0.95105 | |
| 1377- | 1 | 37 | 3 | -1.00000 | 4001 | 3 | | 1.00000 | | EMI4033 |
| 1378- | | | 4002 | 3 | 0.80901 | 4003 | | 3 | 0.30901 | |
| 1379- | 1 | 37 | 4 | -1.00000 | 4001 | 4 | | .00000 | | EMI4034 |
| 1380- | | | 4002 | 4 | 0.30901 | 4003 | | 4 | 0.95105 | |
| 1381- | 1 | 37 | 5 | -1.00000 | 4001 | 5 | | 1.00000 | | EMI4035 |
| 1382- | | | 4002 | 5 | 0.95105 | 4003 | | 5 | 0.30901 | |
| 1383- | 1 | 37 | 6 | -1.00000 | 4001 | 6 | | .00000 | | EMI4036 |
| 1384- | | | 4002 | 6 | 0.30901 | 4003 | | 6 | 0.95105 | |
| 1385- | 1 | 38 | 1 | -1.00000 | 4001 | 1 | | 1.00000 | | EMI4041 |
| 1386- | | | 4002 | 1 | 0.80901 | 4003 | | 1 | 0.30901 | |
| 1387- | 1 | 38 | 2 | -1.00000 | 4001 | 2 | | .00000 | | EMI4042 |
| 1388- | | | 4002 | 2 | 0.30901 | 4003 | | 2 | 0.95105 | |
| 1389- | 1 | 38 | 3 | -1.00000 | 4001 | 3 | | 1.00000 | | EMI4043 |
| 1390- | | | 4002 | 3 | 0.95105 | 4003 | | 3 | 0.30901 | |
| 1391- | 1 | 38 | 4 | -1.00000 | 4001 | 4 | | .00000 | | EMI4044 |
| 1392- | | | 4002 | 4 | 0.30901 | 4003 | | 4 | 0.95105 | |
| 1393- | 1 | 38 | 5 | -1.00000 | 4001 | 5 | | 1.00000 | | EMI4045 |
| 1394- | | | 4002 | 5 | 0.95105 | 4003 | | 5 | 0.30901 | |
| 1395- | 1 | 38 | 6 | -1.00000 | 4001 | 6 | | .00000 | | EMI4046 |
| 1396- | | | 4002 | 6 | 0.30901 | 4003 | | 6 | 0.95105 | |
| 1397- | 1 | 39 | 1 | -1.00000 | 4001 | 1 | | 1.00000 | | EMI4051 |
| 1398- | | | 4002 | 1 | 0.80901 | 4003 | | 1 | 0.30901 | |
| 1399- | 1 | 39 | 2 | -1.00000 | 4001 | 2 | | .00000 | | EMI4052 |
| 1400- | | | 4002 | 2 | 0.95105 | 4003 | | 2 | 0.58778 | |

SORTED BULK DATA ECHO

| CARD
COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------------|---|----|------|---|--------------|------|---------|-----------|---------|---------|
| 1401- | 1 | 39 | 3 | 3 | -1.000004001 | 3 | 1.00000 | 3 | 0.00000 | EMI4053 |
| 1402- | 1 | 39 | 4002 | 4 | 3 0.30901 | 4003 | 4 | 3-0.80901 | | EMI4054 |
| 1403- | 1 | 39 | 4002 | 4 | -1.000004001 | 4003 | 4 | .00000 | | EMI4055 |
| 1404- | 1 | 39 | 4002 | 5 | 4 0.95105 | 4003 | 5 | 4 0.52778 | | EMI4056 |
| 1405- | 1 | 39 | 4002 | 5 | -1.000004001 | 4003 | 5 | 1.00000 | | EMI4061 |
| 1406- | 1 | 39 | 4002 | 6 | 5 0.30901 | 4003 | 6 | 5-0.80901 | | EMI4062 |
| 1407- | 1 | 39 | 4002 | 6 | -1.000004001 | 4003 | 6 | .00000 | | EMI4063 |
| 1408- | 1 | 40 | 4002 | 1 | 6 0.95105 | 4003 | 1 | 6 0.52778 | | EMI4064 |
| 1409- | 1 | 40 | 4002 | 2 | -1.000004001 | 4003 | 2 | 1.00000 | | EMI4065 |
| 1410- | 1 | 40 | 4002 | 2 | 1 0.00000 | 4003 | 2 | 1-1.00000 | | EMI4066 |
| 1411- | 1 | 40 | 4002 | 2 | -1.000004001 | 4003 | 2 | .00000 | | EMI4071 |
| 1412- | 1 | 40 | 4002 | 3 | 2 1.00000 | 4003 | 3 | 2 0.00000 | | EMI4072 |
| 1413- | 1 | 40 | 4002 | 3 | -1.000004001 | 4003 | 3 | 1.00000 | | EMI4073 |
| 1414- | 1 | 40 | 4002 | 4 | 3 0.00000 | 4003 | 4 | 3-1.00000 | | EMI4074 |
| 1415- | 1 | 40 | 4002 | 4 | 3 0.00000 | 4003 | 4 | .00000 | | EMI4075 |
| 1416- | 1 | 40 | 4002 | 5 | -1.000004001 | 4003 | 5 | 4 0.00000 | | EMI4076 |
| 1417- | 1 | 40 | 4002 | 5 | 4 1.00000 | 4003 | 5 | 4 0.00000 | | EMI4081 |
| 1418- | 1 | 40 | 4002 | 6 | -1.000004001 | 4003 | 6 | 1.00000 | | EMI4082 |
| 1419- | 1 | 40 | 4002 | 6 | 5 0.00000 | 4003 | 6 | 5-1.00000 | | EMI4083 |
| 1420- | 1 | 41 | 4002 | 1 | -1.000004001 | 4003 | 1 | .00000 | | EMI4084 |
| 1421- | 1 | 41 | 4002 | 2 | 6 1.00000 | 4003 | 2 | 6 0.00000 | | EMI4085 |
| 1422- | 1 | 41 | 4002 | 3 | -1.000004001 | 4003 | 3 | 1.00000 | | EMI4086 |
| 1423- | 1 | 41 | 4002 | 4 | 1-0.30901 | 4003 | 4 | 1-0.80901 | | EMI4091 |
| 1424- | 1 | 41 | 4002 | 5 | -1.000004001 | 4003 | 5 | .00000 | | EMI4092 |
| 1425- | 1 | 41 | 4002 | 6 | 2 0.95105 | 4003 | 6 | 2-0.52778 | | EMI4093 |
| 1426- | 1 | 41 | 4002 | 3 | -1.000004001 | 4003 | 3 | 1.00000 | | |
| 1427- | 1 | 41 | 4002 | 4 | 3-0.30901 | 4003 | 4 | 3-0.80901 | | |
| 1428- | 1 | 41 | 4002 | 4 | -1.000004001 | 4003 | 4 | .00000 | | |
| 1429- | 1 | 41 | 4002 | 5 | 4 0.95105 | 4003 | 5 | 4-0.52778 | | |
| 1430- | 1 | 41 | 4002 | 6 | -1.000004001 | 4003 | 6 | 1.00000 | | |
| 1431- | 1 | 41 | 4002 | 6 | 5-0.30901 | 4003 | 6 | 5-0.80901 | | |
| 1432- | 1 | 41 | 4002 | 6 | -1.000004001 | 4003 | 6 | .00000 | | |
| 1433- | 1 | 42 | 4002 | 1 | 6 0.95105 | 4003 | 1 | 6-0.52778 | | |
| 1434- | 1 | 42 | 4002 | 2 | -1.000004001 | 4003 | 2 | 1.00000 | | |
| 1435- | 1 | 42 | 4002 | 2 | 1-0.30901 | 4003 | 2 | 1-0.80901 | | |
| 1436- | 1 | 42 | 4002 | 3 | -1.000004001 | 4003 | 3 | .00000 | | |
| 1437- | 1 | 42 | 4002 | 3 | 2 0.00000 | 4003 | 3 | 2-0.95105 | | |
| 1438- | 1 | 42 | 4002 | 4 | -1.000004001 | 4003 | 4 | 1.00000 | | |
| 1439- | 1 | 42 | 4002 | 4 | 4 0.95105 | 4003 | 4 | 4-0.52778 | | |
| 1440- | 1 | 42 | 4002 | 5 | -1.000004001 | 4003 | 5 | 1.00000 | | |
| 1441- | 1 | 42 | 4002 | 5 | 5-0.30901 | 4003 | 5 | 5-0.80901 | | |
| 1442- | 1 | 42 | 4002 | 6 | -1.000004001 | 4003 | 6 | .00000 | | |
| 1443- | 1 | 42 | 4002 | 6 | 6 0.95105 | 4003 | 6 | 6-0.52778 | | |
| 1444- | 1 | 43 | 4002 | 1 | -1.000004001 | 4003 | 1 | 1.00000 | | |
| 1445- | 1 | 43 | 4002 | 1 | 1-0.30901 | 4003 | 1 | 1-0.80901 | | |
| 1446- | 1 | 43 | 4002 | 2 | -1.000004001 | 4003 | 2 | .00000 | | |
| 1447- | 1 | 43 | 4002 | 2 | 2 0.95105 | 4003 | 2 | 2-0.52778 | | |
| 1448- | 1 | 43 | 4002 | 3 | -1.000004001 | 4003 | 3 | 1.00000 | | |
| 1449- | 1 | 43 | 4002 | 3 | 3-0.30901 | 4003 | 3 | 3-0.80901 | | |
| 1450- | 1 | 43 | 4002 | 4 | -1.000004001 | 4003 | 4 | .00000 | | |

ORIGINAL PAGE IS
OF POOR QUALITY

APRIL 11, 1974 NASTRAN 5/13/72

AXISYMMETRIC CYL. WITH FLUID
HARMONIC REDUCTION

SORTED BULK DATA ECHO

| CARD
COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------------|---|----|------|---|----------|------|---|----------|---|---------|
| 1451- | 1 | 43 | 4002 | 4 | -1.00000 | 4001 | 4 | .00000 | | 2M14094 |
| 1452- | 1 | 43 | 4002 | 4 | -0.58778 | 4003 | 4 | 0.095105 | | 2M14095 |
| 1453- | 1 | 43 | 4002 | 5 | -1.00000 | 4001 | 5 | 1.00000 | | 2M14096 |
| 1454- | 1 | 43 | 4002 | 5 | -0.80901 | 4003 | 5 | 0.30901 | | 2M14096 |
| 1455- | 1 | 43 | 4002 | 6 | -1.00000 | 4001 | 6 | .00000 | | 2M14096 |
| 1456- | 1 | 43 | 4002 | 6 | -0.58778 | 4003 | 6 | 0.095105 | | 2M14096 |
| 1457- | 1 | 44 | 4002 | 1 | -1.00000 | 4001 | 1 | 1.00000 | | 2M14101 |
| 1458- | 1 | 44 | 4002 | 1 | -0.95105 | 4003 | 1 | .00000 | | 2M14102 |
| 1459- | 1 | 44 | 4002 | 2 | -1.00000 | 4001 | 2 | .00000 | | 2M14102 |
| 1460- | 1 | 44 | 4002 | 3 | -1.00000 | 4001 | 3 | 1.00000 | | 2M14103 |
| 1461- | 1 | 44 | 4002 | 3 | -1.00000 | 4001 | 3 | 0.095105 | | 2M14103 |
| 1462- | 1 | 44 | 4002 | 4 | -1.00000 | 4001 | 4 | .00000 | | 2M14104 |
| 1463- | 1 | 44 | 4002 | 4 | -0.30901 | 4003 | 4 | 0.095105 | | 2M14104 |
| 1464- | 1 | 44 | 4002 | 5 | -1.00000 | 4001 | 5 | 1.00000 | | 2M14105 |
| 1465- | 1 | 44 | 4002 | 5 | -0.95105 | 4003 | 5 | 0.095105 | | 2M14105 |
| 1466- | 1 | 44 | 4002 | 6 | -1.00000 | 4001 | 6 | .00000 | | 2M14106 |
| 1467- | 1 | 44 | 4002 | 6 | -0.30901 | 4003 | 6 | 0.095105 | | 2M14106 |
| 1468- | 1 | 45 | 4002 | 1 | -1.00000 | 4001 | 1 | 1.00000 | | 2M14111 |
| 1469- | 1 | 45 | 4002 | 2 | -1.00000 | 4001 | 2 | .00000 | | 2M14112 |
| 1470- | 1 | 45 | 4002 | 2 | -1.00000 | 4001 | 2 | 0.095105 | | 2M14112 |
| 1471- | 1 | 45 | 4002 | 3 | -1.00000 | 4001 | 3 | 1.00000 | | 2M14113 |
| 1472- | 1 | 45 | 4002 | 3 | -1.00000 | 4001 | 3 | 0.095105 | | 2M14113 |
| 1473- | 1 | 45 | 4002 | 4 | -1.00000 | 4001 | 4 | .00000 | | 2M14114 |
| 1474- | 1 | 45 | 4002 | 4 | -0.30901 | 4003 | 4 | 0.095105 | | 2M14114 |
| 1475- | 1 | 45 | 4002 | 5 | -1.00000 | 4001 | 5 | 1.00000 | | 2M14115 |
| 1476- | 1 | 45 | 4002 | 5 | -0.95105 | 4003 | 5 | 0.095105 | | 2M14115 |
| 1477- | 1 | 45 | 4002 | 6 | -1.00000 | 4001 | 6 | .00000 | | 2M14116 |
| 1478- | 1 | 45 | 4002 | 6 | -0.30901 | 4003 | 6 | 0.095105 | | 2M14116 |
| 1479- | 1 | 46 | 4002 | 1 | -1.00000 | 5001 | 1 | 1.00000 | | 2M15011 |
| 1480- | 1 | 46 | 4002 | 1 | -1.00000 | 5001 | 1 | .00000 | | 2M15011 |
| 1481- | 1 | 46 | 4002 | 2 | -1.00000 | 5001 | 2 | 0.095105 | | 2M15012 |
| 1482- | 1 | 46 | 4002 | 2 | -1.00000 | 5001 | 2 | .00000 | | 2M15012 |
| 1483- | 1 | 46 | 4002 | 3 | -1.00000 | 5001 | 3 | 1.00000 | | 2M15013 |
| 1484- | 1 | 46 | 4002 | 3 | -1.00000 | 5001 | 3 | 0.095105 | | 2M15013 |
| 1485- | 1 | 46 | 4002 | 4 | -1.00000 | 5001 | 4 | .00000 | | 2M15014 |
| 1486- | 1 | 46 | 4002 | 4 | -0.30901 | 5003 | 4 | 0.095105 | | 2M15014 |
| 1487- | 1 | 46 | 4002 | 5 | -1.00000 | 5001 | 5 | 1.00000 | | 2M15015 |
| 1488- | 1 | 46 | 4002 | 5 | -0.95105 | 5003 | 5 | 0.095105 | | 2M15015 |
| 1489- | 1 | 46 | 4002 | 6 | -1.00000 | 5001 | 6 | .00000 | | 2M15016 |
| 1490- | 1 | 46 | 4002 | 6 | -0.30901 | 5003 | 6 | 0.095105 | | 2M15016 |
| 1491- | 1 | 47 | 4002 | 1 | -1.00000 | 5001 | 1 | 1.00000 | | 2M15021 |
| 1492- | 1 | 47 | 4002 | 1 | -1.00000 | 5001 | 1 | .00000 | | 2M15021 |
| 1493- | 1 | 47 | 4002 | 2 | -1.00000 | 5001 | 2 | 0.095105 | | 2M15022 |
| 1494- | 1 | 47 | 4002 | 2 | -1.00000 | 5001 | 2 | .00000 | | 2M15022 |
| 1495- | 1 | 47 | 4002 | 3 | -1.00000 | 5001 | 3 | 1.00000 | | 2M15023 |
| 1496- | 1 | 47 | 4002 | 3 | -1.00000 | 5001 | 3 | 0.095105 | | 2M15023 |
| 1497- | 1 | 47 | 4002 | 4 | -1.00000 | 5001 | 4 | .00000 | | 2M15024 |
| 1498- | 1 | 47 | 4002 | 4 | -0.30901 | 5003 | 4 | 0.095105 | | 2M15024 |
| 1499- | 1 | 47 | 4002 | 5 | -1.00000 | 5001 | 5 | 1.00000 | | 2M15024 |
| 1500- | 1 | 47 | 4002 | 5 | -0.95105 | 5003 | 5 | 0.095105 | | 2M15024 |

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---|----|------|----------|-----------|------|---------|-----------|---------|---------|
| COUNT | | | | | | | | | | |
| 1501- | 1 | 47 | 5 | -1.00000 | 5001 | 5 | 1.00000 | 5 | 0.80901 | CM15025 |
| 1502- | 1 | 47 | 5002 | 5 | 0.95105 | 5003 | 5 | 0.80901 | | CM15026 |
| 1503- | 1 | 47 | 5002 | 6 | -1.00000 | 5001 | 6 | 0.00000 | | CM15026 |
| 1504- | 1 | 48 | 5002 | 6 | 0.30901 | 5003 | 6 | 0.58778 | | CM15031 |
| 1505- | 1 | 48 | 5002 | 1 | -1.00000 | 5001 | 1 | 1.00000 | | CM15031 |
| 1506- | 1 | 48 | 5002 | 2 | 1.00000 | 5001 | 2 | 1.00000 | | CM15032 |
| 1507- | 1 | 48 | 5002 | 2 | -1.00000 | 5001 | 2 | 0.00000 | | CM15032 |
| 1508- | 1 | 48 | 5002 | 3 | 2.0.58778 | 5003 | 3 | 2.0.95105 | | CM15033 |
| 1509- | 1 | 48 | 5002 | 3 | -1.00000 | 5001 | 3 | 1.00000 | | CM15033 |
| 1510- | 1 | 48 | 5002 | 3 | 0.80901 | 5003 | 3 | 0.30901 | | CM15034 |
| 1511- | 1 | 48 | 5002 | 4 | -1.00000 | 5001 | 4 | 0.00000 | | CM15034 |
| 1512- | 1 | 48 | 5002 | 4 | 0.58778 | 5003 | 4 | 0.95105 | | CM15035 |
| 1513- | 1 | 48 | 5002 | 5 | -1.00000 | 5001 | 5 | 1.00000 | | CM15035 |
| 1514- | 1 | 48 | 5002 | 5 | 0.80901 | 5003 | 5 | 0.30901 | | CM15036 |
| 1515- | 1 | 48 | 5002 | 6 | -1.00000 | 5001 | 6 | 0.00000 | | CM15036 |
| 1516- | 1 | 49 | 5002 | 6 | 0.58778 | 5003 | 6 | 0.95105 | | CM15041 |
| 1517- | 1 | 49 | 5002 | 1 | -1.00000 | 5001 | 1 | 1.00000 | | CM15041 |
| 1518- | 1 | 49 | 5002 | 2 | 1.0.58778 | 5003 | 2 | 1.0.30901 | | CM15042 |
| 1519- | 1 | 49 | 5002 | 2 | -1.00000 | 5001 | 2 | 0.00000 | | CM15042 |
| 1520- | 1 | 49 | 5002 | 3 | 2.0.80901 | 5003 | 3 | 2.0.95105 | | CM15043 |
| 1521- | 1 | 49 | 5002 | 3 | -1.00000 | 5001 | 3 | 1.00000 | | CM15043 |
| 1522- | 1 | 49 | 5002 | 3 | 0.58778 | 5003 | 3 | 0.30901 | | CM15044 |
| 1523- | 1 | 49 | 5002 | 4 | -1.00000 | 5001 | 4 | 0.00000 | | CM15044 |
| 1524- | 1 | 49 | 5002 | 4 | 0.80901 | 5003 | 4 | 0.95105 | | CM15045 |
| 1525- | 1 | 49 | 5002 | 5 | -1.00000 | 5001 | 5 | 1.00000 | | CM15045 |
| 1526- | 1 | 49 | 5002 | 5 | 0.58778 | 5003 | 5 | 0.30901 | | CM15046 |
| 1527- | 1 | 49 | 5002 | 6 | -1.00000 | 5001 | 6 | 0.00000 | | CM15046 |
| 1528- | 1 | 50 | 5002 | 6 | 0.80901 | 5003 | 6 | 0.95105 | | CM15051 |
| 1529- | 1 | 50 | 5002 | 1 | -1.00000 | 5001 | 1 | 1.00000 | | CM15051 |
| 1530- | 1 | 50 | 5002 | 2 | 1.0.30901 | 5003 | 2 | 1.0.80901 | | CM15052 |
| 1531- | 1 | 50 | 5002 | 2 | -1.00000 | 5001 | 2 | 0.00000 | | CM15052 |
| 1532- | 1 | 50 | 5002 | 3 | 2.0.95105 | 5003 | 3 | 2.0.58778 | | CM15053 |
| 1533- | 1 | 50 | 5002 | 3 | -1.00000 | 5001 | 3 | 1.00000 | | CM15053 |
| 1534- | 1 | 50 | 5002 | 4 | 3.0.30901 | 5003 | 4 | 3.0.80901 | | CM15054 |
| 1535- | 1 | 50 | 5002 | 4 | -1.00000 | 5001 | 4 | 0.00000 | | CM15054 |
| 1536- | 1 | 50 | 5002 | 5 | 4.0.95105 | 5003 | 5 | 4.0.58778 | | CM15055 |
| 1537- | 1 | 50 | 5002 | 5 | -1.00000 | 5001 | 5 | 1.00000 | | CM15055 |
| 1538- | 1 | 50 | 5002 | 6 | 5.0.30901 | 5003 | 6 | 5.0.80901 | | CM15056 |
| 1539- | 1 | 50 | 5002 | 6 | -1.00000 | 5001 | 6 | 0.00000 | | CM15056 |
| 1540- | 1 | 51 | 5002 | 6 | 0.95105 | 5003 | 6 | 0.58778 | | CM15061 |
| 1541- | 1 | 51 | 5002 | 1 | -1.00000 | 5001 | 1 | 1.00000 | | CM15061 |
| 1542- | 1 | 51 | 5002 | 1 | 1.0.00000 | 5003 | 1 | 1.0.00000 | | CM15062 |
| 1543- | 1 | 51 | 5002 | 2 | -1.00000 | 5001 | 2 | 0.00000 | | CM15062 |
| 1544- | 1 | 51 | 5002 | 2 | 1.0.00000 | 5003 | 2 | 0.00000 | | CM15063 |
| 1545- | 1 | 51 | 5002 | 3 | -1.00000 | 5001 | 3 | 1.00000 | | CM15063 |
| 1546- | 1 | 51 | 5002 | 3 | 0.00000 | 5003 | 3 | 1.0.00000 | | CM15064 |
| 1547- | 1 | 51 | 5002 | 4 | -1.00000 | 5001 | 4 | 0.00000 | | CM15064 |
| 1548- | 1 | 51 | 5002 | 4 | 1.0.00000 | 5003 | 4 | 0.0.00000 | | CM15065 |
| 1549- | 1 | 51 | 5002 | 5 | -1.00000 | 5001 | 5 | 1.0.00000 | | CM15065 |
| 1550- | 1 | 51 | 5002 | 5 | 0.00000 | 5003 | 5 | 1.0.00000 | | CM15065 |

APRIL 11, 1974

NASTRAN 9/13/72

AXISYMMETRIC CIRC. CYL. WITH FLUID

HARMONIC REDUCTION

SORTED BULK DATA ECHO

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---|----|------|---|--------------|------|-----------|-----------|---------|----|
| COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 1551- | 1 | 51 | 5002 | 6 | -1.000005001 | 6 | 0.00000 | 0.00000 | EMI5066 | |
| 1552- | 1 | 52 | 5002 | 1 | 1.00000 | 5003 | 0.00000 | 0.00000 | EMI5071 | |
| 1553- | 1 | 52 | 5002 | 1 | -1.000005001 | 1 | 1.00000 | 0.00000 | EMI5071 | |
| 1554- | 1 | 52 | 5002 | 2 | 1-0.30901 | 5003 | 1-0.80901 | 0.00000 | EMI5072 | |
| 1555- | 1 | 52 | 5002 | 2 | -1.000005001 | 2 | 0.00000 | 0.00000 | EMI5072 | |
| 1556- | 1 | 52 | 5002 | 3 | 2 0.95105 | 5003 | 2-0.58778 | 2-0.58778 | EMI5073 | |
| 1557- | 1 | 52 | 5002 | 3 | -1.000005001 | 3 | 1.00000 | 1.00000 | EMI5073 | |
| 1558- | 1 | 52 | 5002 | 4 | 3-0.30901 | 5003 | 3-0.80901 | 0.00000 | EMI5074 | |
| 1559- | 1 | 52 | 5002 | 4 | -1.000005001 | 4 | 0.00000 | 0.00000 | EMI5074 | |
| 1560- | 1 | 52 | 5002 | 5 | 4 0.95105 | 5003 | 4-0.58778 | 4-0.58778 | EMI5075 | |
| 1561- | 1 | 52 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 1.00000 | EMI5075 | |
| 1562- | 1 | 52 | 5002 | 6 | 5-0.30901 | 5003 | 5-0.80901 | 0.00000 | EMI5076 | |
| 1563- | 1 | 52 | 5002 | 6 | -1.000005001 | 6 | 0.00000 | 0.00000 | EMI5076 | |
| 1564- | 1 | 53 | 5002 | 1 | 6 0.95105 | 5003 | 6-0.58778 | 6-0.58778 | EMI5081 | |
| 1565- | 1 | 53 | 5002 | 1 | -1.000005001 | 1 | 1.00000 | 1.00000 | EMI5081 | |
| 1566- | 1 | 53 | 5002 | 2 | 1-0.58778 | 5003 | 1-0.30901 | 1-0.30901 | EMI5082 | |
| 1567- | 1 | 53 | 5002 | 2 | -1.000005001 | 2 | 0.00000 | 0.00000 | EMI5082 | |
| 1568- | 1 | 53 | 5002 | 3 | 2 0.80901 | 5003 | 2-0.55105 | 2-0.55105 | EMI5083 | |
| 1569- | 1 | 53 | 5002 | 3 | -1.000005001 | 3 | 1.00000 | 1.00000 | EMI5083 | |
| 1570- | 1 | 53 | 5002 | 4 | 3-0.58778 | 5003 | 3-0.30901 | 3-0.30901 | EMI5084 | |
| 1571- | 1 | 53 | 5002 | 4 | -1.000005001 | 4 | 0.00000 | 0.00000 | EMI5084 | |
| 1572- | 1 | 53 | 5002 | 5 | 4 0.80901 | 5003 | 4-0.55105 | 4-0.55105 | EMI5085 | |
| 1573- | 1 | 53 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 1.00000 | EMI5085 | |
| 1574- | 1 | 53 | 5002 | 6 | 5-0.58778 | 5003 | 5-0.30901 | 5-0.30901 | EMI5086 | |
| 1575- | 1 | 53 | 5002 | 6 | -1.000005001 | 6 | 0.00000 | 0.00000 | EMI5086 | |
| 1576- | 1 | 54 | 5002 | 1 | 6 0.80901 | 5003 | 6-0.55105 | 6-0.55105 | EMI5091 | |
| 1577- | 1 | 54 | 5002 | 1 | -1.000005001 | 1 | 1.00000 | 1.00000 | EMI5091 | |
| 1578- | 1 | 54 | 5002 | 2 | 1-0.80901 | 5003 | 1 0.30901 | 1 0.30901 | EMI5092 | |
| 1579- | 1 | 54 | 5002 | 2 | -1.000005001 | 2 | 0.00000 | 0.00000 | EMI5092 | |
| 1580- | 1 | 54 | 5002 | 3 | 2 0.58778 | 5003 | 2-0.55105 | 2-0.55105 | EMI5093 | |
| 1581- | 1 | 54 | 5002 | 3 | -1.000005001 | 3 | 1.00000 | 1.00000 | EMI5093 | |
| 1582- | 1 | 54 | 5002 | 4 | 3-0.80901 | 5003 | 3 0.30901 | 3 0.30901 | EMI5094 | |
| 1583- | 1 | 54 | 5002 | 4 | -1.000005001 | 4 | 0.00000 | 0.00000 | EMI5094 | |
| 1584- | 1 | 54 | 5002 | 5 | 4 0.95105 | 5003 | 4-0.55105 | 4-0.55105 | EMI5095 | |
| 1585- | 1 | 54 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 1.00000 | EMI5095 | |
| 1586- | 1 | 54 | 5002 | 6 | 5-0.30901 | 5003 | 5 0.30901 | 5 0.30901 | EMI5096 | |
| 1587- | 1 | 54 | 5002 | 6 | -1.000005001 | 6 | 0.00000 | 0.00000 | EMI5096 | |
| 1588- | 1 | 55 | 5002 | 1 | 6 0.58778 | 5003 | 6-0.55105 | 6-0.55105 | EMI5101 | |
| 1589- | 1 | 55 | 5002 | 1 | -1.000005001 | 1 | 1.00000 | 1.00000 | EMI5101 | |
| 1590- | 1 | 55 | 5002 | 2 | 1-0.95105 | 5003 | 1 0.80901 | 1 0.80901 | EMI5102 | |
| 1591- | 1 | 55 | 5002 | 2 | -1.000005001 | 2 | 0.00000 | 0.00000 | EMI5102 | |
| 1592- | 1 | 55 | 5002 | 3 | 2 0.30901 | 5003 | 2-0.58778 | 2-0.58778 | EMI5103 | |
| 1593- | 1 | 55 | 5002 | 3 | -1.000005001 | 3 | 1.00000 | 1.00000 | EMI5103 | |
| 1594- | 1 | 55 | 5002 | 4 | 3-0.95105 | 5003 | 3 0.80901 | 3 0.80901 | EMI5104 | |
| 1595- | 1 | 55 | 5002 | 4 | -1.000005001 | 4 | 0.00000 | 0.00000 | EMI5104 | |
| 1596- | 1 | 55 | 5002 | 5 | 4 0.30901 | 5003 | 4-0.58778 | 4-0.58778 | EMI5105 | |
| 1597- | 1 | 55 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 1.00000 | EMI5105 | |
| 1598- | 1 | 55 | 5002 | 6 | 5-0.95105 | 5003 | 5 0.80901 | 5 0.80901 | EMI5106 | |
| 1599- | 1 | 55 | 5002 | 6 | -1.000005001 | 6 | 0.00000 | 0.00000 | EMI5106 | |
| 1600- | 1 | 55 | 5002 | 6 | 6 0.30901 | 5003 | 6-0.58778 | 6-0.58778 | EMI5106 | |

S O R T E D B U L K D A T A E C H O

| CARD
COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------------|---|----|------|---|--------------|------|---------|----------|---|---------|
| 1601- | 1 | 56 | 1 | 1 | -1.000005001 | 1 | 1.00000 | | | 2M15111 |
| 1602- | 1 | 56 | 5002 | 1 | 1-1.00000 | 5003 | 1 | 1.00000 | | 2M15111 |
| 1603- | 1 | 56 | 2 | 2 | -1.000005001 | 2 | .00000 | | | 2M15112 |
| 1604- | 1 | 56 | 5002 | 3 | 2 0.00000 | 5003 | 2 | -0.00000 | | 2M15113 |
| 1605- | 1 | 56 | 3 | 3 | -1.000005001 | 3 | 1.00000 | | | 2M15113 |
| 1606- | 1 | 56 | 5002 | 4 | 3-1.00000 | 5003 | 3 | 1.00000 | | 2M15114 |
| 1607- | 1 | 56 | 4 | 4 | -1.000005001 | 4 | .00000 | | | 2M15114 |
| 1608- | 1 | 56 | 5002 | 5 | 4 0.00000 | 5003 | 4 | -0.00000 | | 2M15115 |
| 1609- | 1 | 56 | 5 | 5 | -1.000005001 | 5 | 1.00000 | | | 2M15115 |
| 1610- | 1 | 56 | 5002 | 6 | 5-1.00000 | 5003 | 5 | 1.00000 | | 2M15116 |
| 1611- | 1 | 56 | 6 | 6 | -1.000005001 | 6 | .00000 | | | 2M15116 |
| 1612- | 1 | 56 | 5002 | 1 | 6 0.00000 | 5003 | 6 | -0.00000 | | 2M16011 |
| 1613- | 1 | 57 | 1 | 1 | -1.000006001 | 1 | 1.00000 | | | 2M16011 |
| 1614- | 1 | 57 | 6002 | 2 | 1 1.00000 | 6003 | 1 | 1.00000 | | 2M16012 |
| 1615- | 1 | 57 | 2 | 2 | -1.000006001 | 2 | .00000 | | | 2M16012 |
| 1616- | 1 | 57 | 6002 | 3 | 2 0.00000 | 6003 | 2 | 0.00000 | | 2M16013 |
| 1617- | 1 | 57 | 3 | 3 | -1.000006001 | 3 | 1.00000 | | | 2M16013 |
| 1618- | 1 | 57 | 6002 | 4 | 3 1.00000 | 6003 | 3 | 1.00000 | | 2M16014 |
| 1619- | 1 | 57 | 4 | 4 | -1.000006001 | 4 | .00000 | | | 2M16014 |
| 1620- | 1 | 57 | 6002 | 5 | 4 0.00000 | 6003 | 4 | 0.00000 | | 2M16015 |
| 1621- | 1 | 57 | 5 | 5 | -1.000006001 | 5 | 1.00000 | | | 2M16015 |
| 1622- | 1 | 57 | 6002 | 6 | 5 1.00000 | 6003 | 5 | 1.00000 | | 2M16016 |
| 1623- | 1 | 57 | 6 | 6 | -1.000006001 | 6 | .00000 | | | 2M16016 |
| 1624- | 1 | 57 | 6002 | 1 | 6 0.00000 | 6003 | 6 | 0.00000 | | 2M16021 |
| 1625- | 1 | 58 | 1 | 1 | -1.000006001 | 1 | 1.00000 | | | 2M16021 |
| 1626- | 1 | 58 | 6002 | 2 | 1 0.95105 | 6003 | 1 | 0.20901 | | 2M16022 |
| 1627- | 1 | 58 | 2 | 2 | -1.000006001 | 2 | .00000 | | | 2M16022 |
| 1628- | 1 | 58 | 6002 | 3 | 2 0.95105 | 6003 | 2 | 0.95778 | | 2M16023 |
| 1629- | 1 | 58 | 3 | 3 | -1.000006001 | 3 | 1.00000 | | | 2M16023 |
| 1630- | 1 | 58 | 6002 | 4 | 3 0.95105 | 6003 | 3 | 0.80901 | | 2M16024 |
| 1631- | 1 | 58 | 4 | 4 | -1.000006001 | 4 | .00000 | | | 2M16024 |
| 1632- | 1 | 58 | 6002 | 5 | 4 0.95105 | 6003 | 4 | 0.55778 | | 2M16025 |
| 1633- | 1 | 58 | 5 | 5 | -1.000006001 | 5 | 1.00000 | | | 2M16025 |
| 1634- | 1 | 58 | 6002 | 6 | 5 0.95105 | 6003 | 5 | 0.80901 | | 2M16026 |
| 1635- | 1 | 58 | 6 | 6 | -1.000006001 | 6 | .00000 | | | 2M16026 |
| 1636- | 1 | 58 | 6002 | 1 | 6 0.95105 | 6003 | 6 | 0.55778 | | 2M16031 |
| 1637- | 1 | 59 | 1 | 1 | -1.000006001 | 1 | 1.00000 | | | 2M16031 |
| 1638- | 1 | 59 | 6002 | 2 | 1 0.80901 | 6003 | 1 | 0.30901 | | 2M16032 |
| 1639- | 1 | 59 | 2 | 2 | -1.000006001 | 2 | .00000 | | | 2M16032 |
| 1640- | 1 | 59 | 6002 | 3 | 2 0.50778 | 6003 | 2 | 0.95105 | | 2M16033 |
| 1641- | 1 | 59 | 3 | 3 | -1.000006001 | 3 | 1.00000 | | | 2M16033 |
| 1642- | 1 | 59 | 6002 | 4 | 3 0.80901 | 6003 | 3 | 0.30901 | | 2M16034 |
| 1643- | 1 | 59 | 4 | 4 | -1.000006001 | 4 | .00000 | | | 2M16034 |
| 1644- | 1 | 59 | 6002 | 5 | 4 0.50778 | 6003 | 4 | 0.95105 | | 2M16035 |
| 1645- | 1 | 59 | 5 | 5 | -1.000006001 | 5 | 1.00000 | | | 2M16035 |
| 1646- | 1 | 59 | 6002 | 6 | 5 0.80901 | 6003 | 5 | 0.30901 | | 2M16036 |
| 1647- | 1 | 59 | 6 | 6 | -1.000006001 | 6 | .00000 | | | 2M16036 |
| 1648- | 1 | 60 | 6002 | 1 | 6 0.50778 | 6003 | 6 | 0.95105 | | 2M16041 |
| 1649- | 1 | 60 | 1 | 1 | -1.000006001 | 1 | 1.00000 | | | 2M16041 |
| 1650- | 1 | 60 | 6002 | 2 | 1 0.55778 | 6003 | 1 | 0.30901 | | 2M16041 |

ORIGINAL PAGE IS
OF POOR QUALITY

APRIL 11, 1974 NASRAN 5/13/72

AXISymmetric CIRC. CYL. WITH FLUID

HARMONIC REDUCTION

SORTED BULK DATA ECHO

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---|----|---|--------------|------|-----------|---|---|---|---------|
| 1651- | 1 | 60 | 2 | -1.000000001 | 2 | .00000 | | | | EMI6042 |
| 1652- | 1 | 60 | 2 | 2 0.80901 | 6003 | 2 0.95105 | | | | EMI6043 |
| 1653- | 1 | 60 | 3 | -1.000000001 | 3 | 1.00000 | | | | EMI6044 |
| 1654- | 1 | 60 | 3 | 3 0.58778 | 6003 | 3-0.30901 | | | | EMI6044 |
| 1655- | 1 | 60 | 4 | -1.000000001 | 4 | .00000 | | | | EMI6044 |
| 1656- | 1 | 60 | 4 | 4 0.80901 | 6003 | 4 0.95105 | | | | EMI6045 |
| 1657- | 1 | 60 | 5 | -1.000000001 | 5 | 1.00000 | | | | EMI6045 |
| 1658- | 1 | 60 | 5 | 5 0.58778 | 6003 | 5-0.30901 | | | | EMI6046 |
| 1659- | 1 | 60 | 6 | -1.000000001 | 6 | .00000 | | | | EMI6046 |
| 1660- | 1 | 60 | 6 | 6 0.80901 | 6003 | 6 0.95105 | | | | EMI6051 |
| 1661- | 1 | 61 | 1 | -1.000000001 | 1 | 1.00000 | | | | EMI6051 |
| 1662- | 1 | 61 | 2 | 1 0.30901 | 6003 | 1-0.80901 | | | | EMI6052 |
| 1663- | 1 | 61 | 2 | -1.000000001 | 2 | .00000 | | | | EMI6052 |
| 1664- | 1 | 61 | 3 | 2 0.95105 | 6003 | 2 0.58778 | | | | EMI6053 |
| 1665- | 1 | 61 | 3 | -1.000000001 | 3 | 1.00000 | | | | EMI6053 |
| 1666- | 1 | 61 | 4 | 3 0.30901 | 6003 | 3-0.80901 | | | | EMI6054 |
| 1667- | 1 | 61 | 4 | -1.000000001 | 4 | .00000 | | | | EMI6054 |
| 1668- | 1 | 61 | 5 | 4 0.95105 | 6003 | 4 0.58778 | | | | EMI6055 |
| 1669- | 1 | 61 | 5 | -1.000000001 | 5 | 1.00000 | | | | EMI6055 |
| 1670- | 1 | 61 | 6 | 5 0.30901 | 6003 | 5-0.80901 | | | | EMI6056 |
| 1671- | 1 | 61 | 6 | -1.000000001 | 6 | .00000 | | | | EMI6056 |
| 1672- | 1 | 62 | 1 | 6 0.95105 | 6003 | 6 0.58778 | | | | EMI6061 |
| 1673- | 1 | 62 | 1 | -1.000000001 | 1 | 1.00000 | | | | EMI6061 |
| 1674- | 1 | 62 | 2 | 1 0.30901 | 6003 | 1-1.00000 | | | | EMI6062 |
| 1675- | 1 | 62 | 2 | -1.000000001 | 2 | .00000 | | | | EMI6062 |
| 1676- | 1 | 62 | 3 | 2 1.00000 | 6003 | 2 0.00000 | | | | EMI6063 |
| 1677- | 1 | 62 | 3 | -1.000000001 | 3 | 1.00000 | | | | EMI6063 |
| 1678- | 1 | 62 | 4 | 3 0.80901 | 6003 | 3-1.00000 | | | | EMI6064 |
| 1679- | 1 | 62 | 4 | -1.000000001 | 4 | .00000 | | | | EMI6064 |
| 1680- | 1 | 62 | 5 | 4 1.00000 | 6003 | 4 0.00000 | | | | EMI6065 |
| 1681- | 1 | 62 | 5 | -1.000000001 | 5 | 1.00000 | | | | EMI6065 |
| 1682- | 1 | 62 | 6 | 5 0.00000 | 6003 | 5-1.00000 | | | | EMI6066 |
| 1683- | 1 | 62 | 6 | -1.000000001 | 6 | .00000 | | | | EMI6066 |
| 1684- | 1 | 63 | 1 | 6 1.00000 | 6003 | 6 0.00000 | | | | EMI6071 |
| 1685- | 1 | 63 | 1 | -1.000000001 | 1 | 1.00000 | | | | EMI6071 |
| 1686- | 1 | 63 | 2 | 1-0.30901 | 6003 | 1-0.80901 | | | | EMI6072 |
| 1687- | 1 | 63 | 2 | -1.000000001 | 2 | .00000 | | | | EMI6072 |
| 1688- | 1 | 63 | 3 | 2 0.95105 | 6003 | 2-0.58778 | | | | EMI6073 |
| 1689- | 1 | 63 | 3 | -1.000000001 | 3 | 1.00000 | | | | EMI6073 |
| 1690- | 1 | 63 | 4 | 3-0.30901 | 6003 | 3-0.80901 | | | | EMI6074 |
| 1691- | 1 | 63 | 4 | -1.000000001 | 4 | .00000 | | | | EMI6074 |
| 1692- | 1 | 63 | 5 | 4 0.95105 | 6003 | 4-0.58778 | | | | EMI6075 |
| 1693- | 1 | 63 | 5 | -1.000000001 | 5 | 1.00000 | | | | EMI6075 |
| 1694- | 1 | 63 | 6 | 5-0.30901 | 6003 | 5-0.80901 | | | | EMI6076 |
| 1695- | 1 | 63 | 6 | -1.000000001 | 6 | .00000 | | | | EMI6076 |
| 1696- | 1 | 64 | 1 | 6 0.95105 | 6003 | 6-0.58778 | | | | EMI6081 |
| 1697- | 1 | 64 | 1 | -1.000000001 | 1 | 1.00000 | | | | EMI6081 |
| 1698- | 1 | 64 | 2 | 1-0.58778 | 6003 | 1-0.30901 | | | | EMI6082 |
| 1699- | 1 | 64 | 2 | -1.000000001 | 2 | .00000 | | | | EMI6082 |
| 1700- | 1 | 64 | 2 | 2 0.80901 | 6003 | 2-0.95105 | | | | EMI6082 |

AXISYM IIC CIRC. CYL. WITH FLUID
HARMONIC REDUCTION

APRIL 11, 1974 NASTRAN 5/13/72

SORTED BULK DATA ECHO

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---|----|------|---|--------------|------|---|-----------|---|---------|
| COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 1701- | 1 | 64 | 6002 | 3 | -1.000000001 | 6003 | 3 | 1.00000 | | 2M16083 |
| 1702- | 1 | 64 | 6002 | 3 | -0.58778 | 6003 | 3 | -0.20901 | | 2M16084 |
| 1703- | 1 | 64 | 6002 | 4 | -1.000000001 | 6003 | 4 | .00000 | | 2M16085 |
| 1704- | 1 | 64 | 6002 | 4 | 0.80901 | 6003 | 4 | 4-0.95105 | | 2M16086 |
| 1705- | 1 | 64 | 6002 | 5 | -1.000000001 | 6003 | 5 | 1.00000 | | 2M16091 |
| 1706- | 1 | 64 | 6002 | 5 | -0.58778 | 6003 | 5 | 5-0.30901 | | 2M16092 |
| 1707- | 1 | 64 | 6002 | 6 | -1.000000001 | 6003 | 6 | .00000 | | 2M16093 |
| 1708- | 1 | 64 | 6002 | 6 | 0.80901 | 6003 | 6 | 6-0.95105 | | 2M16094 |
| 1709- | 1 | 65 | 6002 | 1 | -1.000000001 | 6003 | 1 | 1.00000 | | 2M16095 |
| 1710- | 1 | 65 | 6002 | 2 | -1.000000001 | 6003 | 2 | 1.00000 | | 2M16096 |
| 1711- | 1 | 65 | 6002 | 2 | 0.58778 | 6003 | 2 | 2-0.95105 | | 2M16101 |
| 1712- | 1 | 65 | 6002 | 3 | -1.000000001 | 6003 | 3 | 1.00000 | | 2M16102 |
| 1713- | 1 | 65 | 6002 | 3 | 0.80901 | 6003 | 3 | 3 0.30901 | | 2M16103 |
| 1714- | 1 | 65 | 6002 | 4 | -1.000000001 | 6003 | 4 | .00000 | | 2M16104 |
| 1715- | 1 | 65 | 6002 | 4 | 0.58778 | 6003 | 4 | 4-0.95105 | | 2M16105 |
| 1716- | 1 | 65 | 6002 | 5 | -1.000000001 | 6003 | 5 | 1.00000 | | 2M16106 |
| 1717- | 1 | 65 | 6002 | 5 | 5-0.30901 | 6003 | 5 | 5 0.30901 | | 2M16111 |
| 1718- | 1 | 65 | 6002 | 6 | -1.000000001 | 6003 | 6 | .00000 | | 2M16112 |
| 1719- | 1 | 65 | 6002 | 6 | 0.58778 | 6003 | 6 | 6-0.95105 | | 2M16113 |
| 1720- | 1 | 66 | 6002 | 1 | -1.000000001 | 6003 | 1 | 1.00000 | | 2M16114 |
| 1721- | 1 | 66 | 6002 | 2 | -1.000000001 | 6003 | 2 | .00000 | | 2M16115 |
| 1722- | 1 | 66 | 6002 | 2 | 0.58778 | 6003 | 2 | 2-0.95105 | | 2M16116 |
| 1723- | 1 | 66 | 6002 | 3 | -1.000000001 | 6003 | 3 | 1.00000 | | 2M17011 |
| 1724- | 1 | 66 | 6002 | 3 | 0.80901 | 6003 | 3 | 3 0.30901 | | 2M17012 |
| 1725- | 1 | 66 | 6002 | 4 | -1.000000001 | 6003 | 4 | .00000 | | 2M17013 |
| 1726- | 1 | 66 | 6002 | 4 | 0.58778 | 6003 | 4 | 4-0.95105 | | |
| 1727- | 1 | 66 | 6002 | 5 | -1.000000001 | 6003 | 5 | 1.00000 | | |
| 1728- | 1 | 66 | 6002 | 5 | 5-0.30901 | 6003 | 5 | 5 0.30901 | | |
| 1729- | 1 | 66 | 6002 | 6 | -1.000000001 | 6003 | 6 | .00000 | | |
| 1730- | 1 | 66 | 6002 | 6 | 0.58778 | 6003 | 6 | 6-0.95105 | | |
| 1731- | 1 | 67 | 6002 | 1 | -1.000000001 | 6003 | 1 | 1.00000 | | |
| 1732- | 1 | 67 | 6002 | 2 | -1.000000001 | 6003 | 2 | .00000 | | |
| 1733- | 1 | 67 | 6002 | 2 | 0.58778 | 6003 | 2 | 2-0.95105 | | |
| 1734- | 1 | 67 | 6002 | 3 | -1.000000001 | 6003 | 3 | 1.00000 | | |
| 1735- | 1 | 67 | 6002 | 3 | 0.80901 | 6003 | 3 | 3 0.30901 | | |
| 1736- | 1 | 67 | 6002 | 4 | -1.000000001 | 6003 | 4 | .00000 | | |
| 1737- | 1 | 67 | 6002 | 4 | 0.58778 | 6003 | 4 | 4-0.95105 | | |
| 1738- | 1 | 67 | 6002 | 5 | -1.000000001 | 6003 | 5 | 1.00000 | | |
| 1739- | 1 | 67 | 6002 | 5 | 5-0.30901 | 6003 | 5 | 5 0.30901 | | |
| 1740- | 1 | 67 | 6002 | 6 | -1.000000001 | 6003 | 6 | .00000 | | |
| 1741- | 1 | 67 | 6002 | 6 | 0.58778 | 6003 | 6 | 6-0.95105 | | |
| 1742- | 1 | 67 | 6002 | 1 | -1.000000001 | 6003 | 1 | 1.00000 | | |
| 1743- | 1 | 67 | 6002 | 2 | -1.000000001 | 6003 | 2 | .00000 | | |
| 1744- | 1 | 67 | 6002 | 2 | 0.58778 | 6003 | 2 | 2-0.95105 | | |
| 1745- | 1 | 67 | 6002 | 3 | -1.000000001 | 6003 | 3 | 1.00000 | | |
| 1746- | 1 | 67 | 6002 | 3 | 0.80901 | 6003 | 3 | 3 0.30901 | | |
| 1747- | 1 | 67 | 6002 | 4 | -1.000000001 | 6003 | 4 | .00000 | | |
| 1748- | 1 | 67 | 6002 | 4 | 0.58778 | 6003 | 4 | 4-0.95105 | | |
| 1749- | 1 | 67 | 6002 | 5 | -1.000000001 | 6003 | 5 | 1.00000 | | |
| 1750- | 1 | 67 | 6002 | 5 | 5-0.30901 | 6003 | 5 | 5 0.30901 | | |
| 1751- | 1 | 67 | 6002 | 6 | -1.000000001 | 6003 | 6 | .00000 | | |
| 1752- | 1 | 67 | 6002 | 6 | 0.58778 | 6003 | 6 | 6-0.95105 | | |
| 1753- | 1 | 68 | 7002 | 1 | -1.000000001 | 7003 | 1 | 1.00000 | | |
| 1754- | 1 | 68 | 7002 | 2 | -1.000000001 | 7003 | 2 | .00000 | | |
| 1755- | 1 | 68 | 7002 | 2 | 0.58778 | 7003 | 2 | 2-0.95105 | | |
| 1756- | 1 | 68 | 7002 | 3 | -1.000000001 | 7003 | 3 | 1.00000 | | |
| 1757- | 1 | 68 | 7002 | 3 | 0.80901 | 7003 | 3 | 3 0.30901 | | |
| 1758- | 1 | 68 | 7002 | 4 | -1.000000001 | 7003 | 4 | .00000 | | |
| 1759- | 1 | 68 | 7002 | 4 | 0.58778 | 7003 | 4 | 4-0.95105 | | |
| 1760- | 1 | 68 | 7002 | 5 | -1.000000001 | 7003 | 5 | 1.00000 | | |
| 1761- | 1 | 68 | 7002 | 5 | 5-0.30901 | 7003 | 5 | 5 0.30901 | | |
| 1762- | 1 | 68 | 7002 | 6 | -1.000000001 | 7003 | 6 | .00000 | | |
| 1763- | 1 | 68 | 7002 | 6 | 0.58778 | 7003 | 6 | 6-0.95105 | | |
| 1764- | 1 | 68 | 7002 | 1 | -1.000000001 | 7003 | 1 | 1.00000 | | |
| 1765- | 1 | 68 | 7002 | 2 | -1.000000001 | 7003 | 2 | .00000 | | |
| 1766- | 1 | 68 | 7002 | 2 | 0.58778 | 7003 | 2 | 2-0.95105 | | |
| 1767- | 1 | 68 | 7002 | 3 | -1.000000001 | 7003 | 3 | 1.00000 | | |
| 1768- | 1 | 68 | 7002 | 3 | 0.80901 | 7003 | 3 | 3 0.30901 | | |
| 1769- | 1 | 68 | 7002 | 4 | -1.000000001 | 7003 | 4 | .00000 | | |
| 1770- | 1 | 68 | 7002 | 4 | 0.58778 | 7003 | 4 | 4-0.95105 | | |
| 1771- | 1 | 68 | 7002 | 5 | -1.000000001 | 7003 | 5 | 1.00000 | | |
| 1772- | 1 | 68 | 7002 | 5 | 5-0.30901 | 7003 | 5 | 5 0.30901 | | |
| 1773- | 1 | 68 | 7002 | 6 | -1.000000001 | 7003 | 6 | .00000 | | |
| 1774- | 1 | 68 | 7002 | 6 | 0.58778 | 7003 | 6 | 6-0.95105 | | |
| 1775- | 1 | 68 | 7002 | 1 | -1.000000001 | 7003 | 1 | 1.00000 | | |
| 1776- | 1 | 68 | 7002 | 2 | -1.000000001 | 7003 | 2 | .00000 | | |
| 1777- | 1 | 68 | 7002 | 2 | 0.58778 | 7003 | 2 | 2-0.95105 | | |
| 1778- | 1 | 68 | 7002 | 3 | -1.000000001 | 7003 | 3 | 1.00000 | | |
| 1779- | 1 | 68 | 7002 | 3 | 0.80901 | 7003 | 3 | 3 0.30901 | | |
| 1780- | 1 | 68 | 7002 | 4 | -1.000000001 | 7003 | 4 | .00000 | | |
| 1781- | 1 | 68 | 7002 | 4 | 0.58778 | 7003 | 4 | 4-0.95105 | | |
| 1782- | 1 | 68 | 7002 | 5 | -1.000000001 | 7003 | 5 | 1.00000 | | |
| 1783- | 1 | 68 | 7002 | 5 | 5-0.30901 | 7003 | 5 | 5 0.30901 | | |
| 1784- | 1 | 68 | 7002 | 6 | -1.000000001 | 7003 | 6 | .00000 | | |
| 1785- | 1 | 68 | 7002 | 6 | 0.58778 | 7003 | 6 | 6-0.95105 | | |
| 1786- | 1 | 68 | 7002 | 1 | -1.000000001 | 7003 | 1 | 1.00000 | | |
| 1787- | 1 | 68 | 7002 | 2 | -1.000000001 | 7003 | 2 | .00000 | | |
| 1788- | 1 | 68 | 7002 | 2 | 0.58778 | 7003 | 2 | 2-0.95105 | | |
| 1789- | 1 | 68 | 7002 | 3 | -1.000000001 | 7003 | 3 | 1.00000 | | |
| 1790- | 1 | 68 | 7002 | 3 | 0.80901 | 7003 | 3 | 3 0.30901 | | |
| 1791- | 1 | 68 | 7002 | 4 | -1.000000001 | 7003 | 4 | .00000 | | |
| 1792- | 1 | 68 | 7002 | 4 | 0.58778 | 7003 | 4 | 4-0.95105 | | |
| 1793- | 1 | 68 | 7002 | 5 | -1.000000001 | 7003 | 5 | 1.00000 | | |
| 1794- | 1 | 68 | 7002 | 5 | 5-0.30901 | 7003 | 5 | 5 0.30901 | | |
| 1795- | 1 | 68 | 7002 | 6 | -1.000000001 | 7003 | 6 | .00000 | | |
| 1796- | 1 | 68 | 7002 | 6 | 0.58778 | 7003 | 6 | 6-0.95105 | | |
| 1797- | 1 | 68 | 7002 | 1 | -1.000000001 | 7003 | 1 | 1.00000 | | |
| 1798- | 1 | 68 | 7002 | 2 | -1.000000001 | 7003 | 2 | .00000 | | |
| 1799- | 1 | 68 | 7002 | 2 | 0.58778 | 7003 | 2 | 2-0.95105 | | |
| 1800- | 1 | 68 | 7002 | 3 | -1.000000001 | 7003 | 3 | 1.00000 | | |

SORTED BULK DATA ECHO

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---|----|------|---|--------------|------|---------|---------|---------|---------|
| COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 1751- | 1 | 68 | 7002 | 4 | -1.000007001 | 4 | .00000 | 4 | .00000 | EM17014 |
| 1752- | 1 | 68 | 7002 | 4 | 0.00000 | 7003 | 4 | 0.00000 | 4 | EM17015 |
| 1753- | 1 | 68 | 7002 | 5 | -1.000007001 | 5 | 1.00000 | 5 | 1.00000 | EM17016 |
| 1754- | 1 | 68 | 7002 | 6 | -1.000007001 | 6 | .00000 | 6 | .00000 | EM17017 |
| 1755- | 1 | 68 | 7002 | 6 | 0.00000 | 7003 | 6 | 0.00000 | 6 | EM17018 |
| 1756- | 1 | 68 | 7002 | 6 | -1.000007001 | 6 | 1.00000 | 6 | 1.00000 | EM17019 |
| 1757- | 1 | 69 | 7002 | 1 | -1.000007001 | 1 | .00000 | 1 | .00000 | EM17020 |
| 1758- | 1 | 69 | 7002 | 2 | -1.000007001 | 2 | .00000 | 2 | .00000 | EM17021 |
| 1759- | 1 | 69 | 7002 | 2 | 0.00000 | 7003 | 2 | 0.00000 | 2 | EM17022 |
| 1760- | 1 | 69 | 7002 | 3 | -1.000007001 | 3 | 1.00000 | 3 | 1.00000 | EM17023 |
| 1761- | 1 | 69 | 7002 | 4 | -1.000007001 | 4 | .00000 | 4 | .00000 | EM17024 |
| 1762- | 1 | 69 | 7002 | 4 | 0.00000 | 7003 | 4 | 0.00000 | 4 | EM17025 |
| 1763- | 1 | 69 | 7002 | 5 | -1.000007001 | 5 | 1.00000 | 5 | 1.00000 | EM17026 |
| 1764- | 1 | 69 | 7002 | 6 | -1.000007001 | 6 | .00000 | 6 | .00000 | EM17027 |
| 1765- | 1 | 69 | 7002 | 6 | 0.00000 | 7003 | 6 | 0.00000 | 6 | EM17028 |
| 1766- | 1 | 69 | 7002 | 6 | -1.000007001 | 6 | 1.00000 | 6 | 1.00000 | EM17029 |
| 1767- | 1 | 69 | 7002 | 6 | 0.00000 | 7003 | 6 | 0.00000 | 6 | EM17030 |
| 1768- | 1 | 69 | 7002 | 6 | -1.000007001 | 6 | .00000 | 6 | .00000 | EM17031 |
| 1769- | 1 | 69 | 7002 | 6 | 0.00000 | 7003 | 6 | 0.00000 | 6 | EM17032 |
| 1770- | 1 | 70 | 7002 | 1 | -1.000007001 | 1 | 1.00000 | 1 | 1.00000 | EM17033 |
| 1771- | 1 | 70 | 7002 | 2 | 0.00000 | 7003 | 2 | 0.00000 | 2 | EM17034 |
| 1772- | 1 | 70 | 7002 | 3 | -1.000007001 | 3 | 1.00000 | 3 | 1.00000 | EM17035 |
| 1773- | 1 | 70 | 7002 | 3 | 0.00000 | 7003 | 3 | 0.00000 | 3 | EM17036 |
| 1774- | 1 | 70 | 7002 | 4 | -1.000007001 | 4 | .00000 | 4 | .00000 | EM17037 |
| 1775- | 1 | 70 | 7002 | 4 | 0.00000 | 7003 | 4 | 0.00000 | 4 | EM17038 |
| 1776- | 1 | 70 | 7002 | 5 | -1.000007001 | 5 | 1.00000 | 5 | 1.00000 | EM17039 |
| 1777- | 1 | 70 | 7002 | 5 | 0.00000 | 7003 | 5 | 0.00000 | 5 | EM17040 |
| 1778- | 1 | 70 | 7002 | 6 | -1.000007001 | 6 | .00000 | 6 | .00000 | EM17041 |
| 1779- | 1 | 70 | 7002 | 6 | 0.00000 | 7003 | 6 | 0.00000 | 6 | EM17042 |
| 1780- | 1 | 70 | 7002 | 6 | -1.000007001 | 6 | 1.00000 | 6 | 1.00000 | EM17043 |
| 1781- | 1 | 71 | 7002 | 1 | -1.000007001 | 1 | 1.00000 | 1 | 1.00000 | EM17044 |
| 1782- | 1 | 71 | 7002 | 2 | 0.00000 | 7003 | 2 | 0.00000 | 2 | EM17045 |
| 1783- | 1 | 71 | 7002 | 2 | -1.000007001 | 2 | .00000 | 2 | .00000 | EM17046 |
| 1784- | 1 | 71 | 7002 | 3 | 0.00000 | 7003 | 3 | 0.00000 | 3 | EM17047 |
| 1785- | 1 | 71 | 7002 | 3 | -1.000007001 | 3 | 1.00000 | 3 | 1.00000 | EM17048 |
| 1786- | 1 | 71 | 7002 | 4 | -1.000007001 | 4 | .00000 | 4 | .00000 | EM17049 |
| 1787- | 1 | 71 | 7002 | 4 | 0.00000 | 7003 | 4 | 0.00000 | 4 | EM17050 |
| 1788- | 1 | 71 | 7002 | 5 | -1.000007001 | 5 | 1.00000 | 5 | 1.00000 | EM17051 |
| 1789- | 1 | 71 | 7002 | 5 | 0.00000 | 7003 | 5 | 0.00000 | 5 | EM17052 |
| 1790- | 1 | 71 | 7002 | 6 | -1.000007001 | 6 | .00000 | 6 | .00000 | EM17053 |
| 1791- | 1 | 71 | 7002 | 6 | 0.00000 | 7003 | 6 | 0.00000 | 6 | EM17054 |
| 1792- | 1 | 71 | 7002 | 6 | -1.000007001 | 6 | 1.00000 | 6 | 1.00000 | EM17055 |
| 1793- | 1 | 72 | 7002 | 1 | -1.000007001 | 1 | 1.00000 | 1 | 1.00000 | EM17056 |
| 1794- | 1 | 72 | 7002 | 2 | 0.00000 | 7003 | 2 | 0.00000 | 2 | EM17057 |
| 1795- | 1 | 72 | 7002 | 2 | -1.000007001 | 2 | .00000 | 2 | .00000 | EM17058 |
| 1796- | 1 | 72 | 7002 | 3 | 0.00000 | 7003 | 3 | 0.00000 | 3 | EM17059 |
| 1797- | 1 | 72 | 7002 | 3 | -1.000007001 | 3 | 1.00000 | 3 | 1.00000 | EM17060 |
| 1798- | 1 | 72 | 7002 | 4 | -1.000007001 | 4 | .00000 | 4 | .00000 | EM17061 |
| 1799- | 1 | 72 | 7002 | 4 | 0.00000 | 7003 | 4 | 0.00000 | 4 | EM17062 |
| 1800- | 1 | 72 | 7002 | 4 | -1.000007001 | 4 | 1.00000 | 4 | 1.00000 | EM17063 |

SORTED BULK DATA RECORD

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---|----|------|---|--------------|------|---|-----------|---|---------|
| COUNT | 1 | 72 | 7002 | 5 | -1.000000001 | 7003 | 5 | 1.00000 | 9 | CM17055 |
| 1801- | 1 | 72 | 7002 | 5 | 0.30901 | 7003 | 5 | 5-0.80901 | | CM17056 |
| 1802- | 1 | 72 | 7002 | 6 | -1.000000001 | 7003 | 6 | .00000 | | CM17056 |
| 1803- | 1 | 72 | 7002 | 6 | 0.95105 | 7003 | 6 | 0.58778 | | CM17061 |
| 1804- | 1 | 72 | 7002 | 1 | -1.000000001 | 7003 | 1 | 1.00000 | | CM17061 |
| 1805- | 1 | 73 | 7002 | 1 | 0.00000 | 7003 | 1 | 1-1.00000 | | CM17062 |
| 1806- | 1 | 73 | 7002 | 2 | -1.000000001 | 7003 | 2 | .00000 | | CM17062 |
| 1807- | 1 | 73 | 7002 | 2 | 1.00000 | 7003 | 2 | 2 0.00000 | | CM17063 |
| 1808- | 1 | 73 | 7002 | 3 | -1.000000001 | 7003 | 3 | 1.00000 | | CM17063 |
| 1809- | 1 | 73 | 7002 | 3 | 0.00000 | 7003 | 3 | 3-1.00000 | | CM17064 |
| 1810- | 1 | 73 | 7002 | 4 | -1.000000001 | 7003 | 4 | .00000 | | CM17064 |
| 1811- | 1 | 73 | 7002 | 4 | 1.00000 | 7003 | 4 | 4 0.00000 | | CM17065 |
| 1812- | 1 | 73 | 7002 | 5 | -1.000000001 | 7003 | 5 | 1.00000 | | CM17065 |
| 1813- | 1 | 73 | 7002 | 5 | 0.30901 | 7003 | 5 | 5-1.00000 | | CM17066 |
| 1814- | 1 | 73 | 7002 | 6 | -1.000000001 | 7003 | 6 | .00000 | | CM17066 |
| 1815- | 1 | 73 | 7002 | 6 | 1.00000 | 7003 | 6 | 6 0.00000 | | CM17071 |
| 1816- | 1 | 74 | 7002 | 1 | -1.000000001 | 7003 | 1 | 1.00000 | | CM17071 |
| 1817- | 1 | 74 | 7002 | 1 | 0.30901 | 7003 | 1 | 1-0.80901 | | CM17072 |
| 1818- | 1 | 74 | 7002 | 2 | -1.000000001 | 7003 | 2 | .00000 | | CM17072 |
| 1819- | 1 | 74 | 7002 | 2 | 2 0.95105 | 7003 | 2 | 2-0.58778 | | CM17073 |
| 1820- | 1 | 74 | 7002 | 3 | -1.000000001 | 7003 | 3 | 1.00000 | | CM17073 |
| 1821- | 1 | 74 | 7002 | 3 | 0.30901 | 7003 | 3 | 3-0.80901 | | CM17074 |
| 1822- | 1 | 74 | 7002 | 4 | -1.000000001 | 7003 | 4 | .00000 | | CM17074 |
| 1823- | 1 | 74 | 7002 | 4 | 0.95105 | 7003 | 4 | 4-0.58778 | | CM17075 |
| 1824- | 1 | 74 | 7002 | 5 | -1.000000001 | 7003 | 5 | 1.00000 | | CM17075 |
| 1825- | 1 | 74 | 7002 | 5 | 0.30901 | 7003 | 5 | 5-0.80901 | | CM17076 |
| 1826- | 1 | 74 | 7002 | 6 | -1.000000001 | 7003 | 6 | .00000 | | CM17076 |
| 1827- | 1 | 74 | 7002 | 6 | 0.95105 | 7003 | 6 | 6-0.58778 | | CM17081 |
| 1828- | 1 | 75 | 7002 | 1 | -1.000000001 | 7003 | 1 | 1.00000 | | CM17081 |
| 1829- | 1 | 75 | 7002 | 1 | 0.30901 | 7003 | 1 | 1-0.30901 | | CM17082 |
| 1830- | 1 | 75 | 7002 | 2 | -1.000000001 | 7003 | 2 | .00000 | | CM17082 |
| 1831- | 1 | 75 | 7002 | 2 | 2 0.95105 | 7003 | 2 | 2-0.95105 | | CM17083 |
| 1832- | 1 | 75 | 7002 | 3 | -1.000000001 | 7003 | 3 | 1.00000 | | CM17083 |
| 1833- | 1 | 75 | 7002 | 3 | 0.30901 | 7003 | 3 | 3-0.30901 | | CM17084 |
| 1834- | 1 | 75 | 7002 | 4 | -1.000000001 | 7003 | 4 | .00000 | | CM17084 |
| 1835- | 1 | 75 | 7002 | 4 | 0.30901 | 7003 | 4 | 4-0.55105 | | CM17085 |
| 1836- | 1 | 75 | 7002 | 5 | -1.000000001 | 7003 | 5 | 1.00000 | | CM17085 |
| 1837- | 1 | 75 | 7002 | 5 | 0.58778 | 7003 | 5 | 5-0.30901 | | CM17086 |
| 1838- | 1 | 75 | 7002 | 6 | -1.000000001 | 7003 | 6 | .00000 | | CM17086 |
| 1839- | 1 | 75 | 7002 | 6 | 0.80901 | 7003 | 6 | 6-0.95105 | | CM17091 |
| 1840- | 1 | 76 | 7002 | 1 | -1.000000001 | 7003 | 1 | 1.00000 | | CM17091 |
| 1841- | 1 | 76 | 7002 | 1 | 0.30901 | 7003 | 1 | 1 0.30901 | | CM17092 |
| 1842- | 1 | 76 | 7002 | 2 | -1.000000001 | 7003 | 2 | .00000 | | CM17092 |
| 1843- | 1 | 76 | 7002 | 2 | 2 0.58778 | 7003 | 2 | 2-0.95105 | | CM17093 |
| 1844- | 1 | 76 | 7002 | 3 | -1.000000001 | 7003 | 3 | 1.00000 | | CM17093 |
| 1845- | 1 | 76 | 7002 | 3 | 0.30901 | 7003 | 3 | 3 0.30901 | | CM17094 |
| 1846- | 1 | 76 | 7002 | 4 | -1.000000001 | 7003 | 4 | .00000 | | CM17094 |
| 1847- | 1 | 76 | 7002 | 4 | 0.58778 | 7003 | 4 | 4-0.55105 | | CM17095 |
| 1848- | 1 | 76 | 7002 | 5 | -1.000000001 | 7003 | 5 | 1.00000 | | CM17095 |
| 1849- | 1 | 76 | 7002 | 5 | 0.30901 | 7003 | 5 | 5 0.30901 | | CM17095 |
| 1850- | 1 | 76 | 7002 | 5 | -1.000000001 | 7003 | 5 | .00000 | | CM17095 |

ORIGINAL PAGE IS
OF POOR QUALITY

| CARD | COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|-------|----|------|---|-------------|------|-----------|---|---|---|---------|
| 1851- | 1 | 76 | 7002 | 6 | -1.00000001 | 6 | .00000 | | | | EM17096 |
| 1852- | 1 | 77 | 7002 | 1 | 6 0.58778 | 7003 | 5-0.95105 | | | | EM17101 |
| 1853- | 1 | 77 | 7002 | 2 | -1.00000001 | 7003 | 1.00000 | | | | EM17102 |
| 1854- | 1 | 77 | 7002 | 2 | 1-0.95105 | 7003 | 1 0.80901 | | | | EM17103 |
| 1855- | 1 | 77 | 7002 | 2 | -1.00000001 | 7003 | .00000 | | | | EM17104 |
| 1856- | 1 | 77 | 7002 | 3 | 2 0.30901 | 7003 | 2-0.58778 | | | | EM17105 |
| 1857- | 1 | 77 | 7002 | 3 | -1.00000001 | 7003 | 1.00000 | | | | EM17106 |
| 1858- | 1 | 77 | 7002 | 4 | 3-0.95105 | 7003 | 3 0.80901 | | | | EM17107 |
| 1859- | 1 | 77 | 7002 | 4 | -1.00000001 | 7003 | .00000 | | | | EM17108 |
| 1860- | 1 | 77 | 7002 | 5 | 4 0.30901 | 7003 | 4-0.58778 | | | | EM17109 |
| 1861- | 1 | 77 | 7002 | 5 | -1.00000001 | 7003 | 1.00000 | | | | EM17110 |
| 1862- | 1 | 77 | 7002 | 6 | 5-0.95105 | 7003 | 5 0.80901 | | | | EM17111 |
| 1863- | 1 | 77 | 7002 | 6 | -1.00000001 | 7003 | .00000 | | | | EM17112 |
| 1864- | 1 | 78 | 7002 | 1 | 6 0.30901 | 7003 | 6-0.58778 | | | | EM17113 |
| 1865- | 1 | 78 | 7002 | 2 | -1.00000001 | 7003 | 1.00000 | | | | EM17114 |
| 1866- | 1 | 78 | 7002 | 2 | 1-1.00000 | 7003 | 1 1.00000 | | | | EM17115 |
| 1867- | 1 | 78 | 7002 | 2 | -1.00000001 | 7003 | .00000 | | | | EM17116 |
| 1868- | 1 | 78 | 7002 | 3 | 2 0.00000 | 7003 | 2-0.00000 | | | | EM18011 |
| 1869- | 1 | 78 | 7002 | 3 | -1.00000001 | 7003 | 1.00000 | | | | EM18012 |
| 1870- | 1 | 78 | 7002 | 4 | 3-1.00000 | 7003 | 3 1.00000 | | | | EM18013 |
| 1871- | 1 | 78 | 7002 | 4 | -1.00000001 | 7003 | .00000 | | | | EM18014 |
| 1872- | 1 | 78 | 7002 | 5 | 4 0.30901 | 7003 | 4-0.00000 | | | | EM18015 |
| 1873- | 1 | 78 | 7002 | 5 | -1.00000001 | 7003 | 1.00000 | | | | EM18016 |
| 1874- | 1 | 78 | 7002 | 6 | 5-1.00000 | 7003 | 5 1.00000 | | | | EM18017 |
| 1875- | 1 | 78 | 7002 | 6 | -1.00000001 | 7003 | .00000 | | | | EM18018 |
| 1876- | 1 | 79 | 8002 | 1 | 6 0.30901 | 8003 | 6-0.00000 | | | | EM18019 |
| 1877- | 1 | 79 | 8002 | 2 | -1.00000001 | 8003 | 1.00000 | | | | EM18020 |
| 1878- | 1 | 79 | 8002 | 2 | 2 0.30901 | 8003 | 2 0.00000 | | | | EM18021 |
| 1879- | 1 | 79 | 8002 | 3 | -1.00000001 | 8003 | 1.00000 | | | | EM18022 |
| 1880- | 1 | 79 | 8002 | 3 | 3 1.00000 | 8003 | 3 1.00000 | | | | EM18023 |
| 1881- | 1 | 79 | 8002 | 4 | -1.00000001 | 8003 | .00000 | | | | EM18024 |
| 1882- | 1 | 79 | 8002 | 4 | 4 0.00000 | 8003 | 4 0.00000 | | | | EM18025 |
| 1883- | 1 | 79 | 8002 | 5 | -1.00000001 | 8003 | 1.00000 | | | | EM18026 |
| 1884- | 1 | 79 | 8002 | 5 | 5 1.00000 | 8003 | 5 1.00000 | | | | EM18027 |
| 1885- | 1 | 79 | 8002 | 6 | -1.00000001 | 8003 | .00000 | | | | EM18028 |
| 1886- | 1 | 80 | 8002 | 1 | 6 0.00000 | 8003 | 6 0.00000 | | | | EM18029 |
| 1887- | 1 | 80 | 8002 | 1 | -1.00000001 | 8003 | 1.00000 | | | | EM18030 |
| 1888- | 1 | 80 | 8002 | 2 | 1 0.95105 | 8003 | 1 0.80901 | | | | EM18031 |
| 1889- | 1 | 80 | 8002 | 2 | -1.00000001 | 8003 | .00000 | | | | EM18032 |
| 1890- | 1 | 80 | 8002 | 3 | 2 0.30901 | 8003 | 2 0.58778 | | | | EM18033 |
| 1891- | 1 | 80 | 8002 | 3 | -1.00000001 | 8003 | 1.00000 | | | | EM18034 |
| 1892- | 1 | 80 | 8002 | 4 | 3 0.95105 | 8003 | 3 0.80901 | | | | EM18035 |
| 1893- | 1 | 80 | 8002 | 4 | -1.00000001 | 8003 | .00000 | | | | EM18036 |
| 1894- | 1 | 80 | 8002 | 5 | 4 0.30901 | 8003 | 4 0.58778 | | | | EM18037 |
| 1895- | 1 | 80 | 8002 | 5 | -1.00000001 | 8003 | 1.00000 | | | | EM18038 |
| 1896- | 1 | 80 | 8002 | 6 | 5 0.95105 | 8003 | 5 0.80901 | | | | EM18039 |
| 1897- | 1 | 80 | 8002 | 6 | -1.00000001 | 8003 | .00000 | | | | EM18040 |
| 1898- | 1 | 80 | 8002 | 6 | 6 0.30901 | 8003 | 6 0.58778 | | | | EM18041 |

APRIL 11, 1974 NASTRAY 5/13/72

AXISYMMETRIC CIRC. CYL. WITH FLUID
HARMONIC REDUCTION

SORTED BULK DATA ECHO

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---|----|------|---|--------------|------|---|-----------|---|---------|
| 1901- | 1 | 81 | 1 | 1 | -1.000000001 | 8003 | 1 | 1.00000 | | EM18031 |
| 1902- | 1 | 81 | 8002 | 2 | 1 0.80901 | 8003 | 2 | 1 0.30901 | | EM18032 |
| 1903- | 1 | 81 | 8002 | 2 | -1.000000001 | 8003 | 2 | .00000 | | EM18033 |
| 1904- | 1 | 81 | 8002 | 2 | 2 0.58778 | 8003 | 3 | 2 0.95105 | | EM18034 |
| 1905- | 1 | 81 | 8002 | 3 | -1.000000001 | 8003 | 3 | 3 0.30901 | | EM18035 |
| 1906- | 1 | 81 | 8002 | 4 | 3 0.80901 | 8003 | 4 | .00000 | | EM18036 |
| 1907- | 1 | 81 | 8002 | 4 | -1.000000001 | 8003 | 4 | 4 0.55105 | | EM18037 |
| 1908- | 1 | 81 | 8002 | 5 | 4 0.58778 | 8003 | 5 | 1.00000 | | EM18038 |
| 1909- | 1 | 81 | 8002 | 5 | -1.000000001 | 8003 | 5 | 5 0.30901 | | EM18039 |
| 1910- | 1 | 81 | 8002 | 6 | 5 0.80901 | 8003 | 6 | .00000 | | EM18040 |
| 1911- | 1 | 81 | 8002 | 6 | -1.000000001 | 8003 | 6 | 6 0.95105 | | EM18041 |
| 1912- | 1 | 82 | 8002 | 1 | 6 0.58778 | 8003 | 1 | 1.00000 | | EM18042 |
| 1913- | 1 | 82 | 8002 | 1 | -1.000000001 | 8003 | 2 | 1-0.30901 | | EM18043 |
| 1914- | 1 | 82 | 8002 | 2 | 1 0.58778 | 8003 | 2 | .00000 | | EM18044 |
| 1915- | 1 | 82 | 8002 | 2 | -1.000000001 | 8003 | 3 | 2 0.95105 | | EM18045 |
| 1916- | 1 | 82 | 8002 | 3 | 2 0.80901 | 8003 | 3 | 1.00000 | | EM18046 |
| 1917- | 1 | 82 | 8002 | 3 | -1.000000001 | 8003 | 4 | 3-0.30901 | | EM18047 |
| 1918- | 1 | 82 | 8002 | 4 | 3 0.58778 | 8003 | 4 | .00000 | | EM18048 |
| 1919- | 1 | 82 | 8002 | 4 | -1.000000001 | 8003 | 5 | 4 0.95105 | | EM18049 |
| 1920- | 1 | 82 | 8002 | 5 | 4 0.80901 | 8003 | 5 | 1.00000 | | EM18050 |
| 1921- | 1 | 82 | 8002 | 5 | -1.000000001 | 8003 | 6 | 5-0.30901 | | EM18051 |
| 1922- | 1 | 82 | 8002 | 6 | 5 0.58778 | 8003 | 6 | .00000 | | EM18052 |
| 1923- | 1 | 82 | 8002 | 6 | -1.000000001 | 8003 | 1 | 6 0.95105 | | EM18053 |
| 1924- | 1 | 83 | 8002 | 1 | 6 0.80901 | 8003 | 2 | 1-0.80901 | | EM18054 |
| 1925- | 1 | 83 | 8002 | 2 | -1.000000001 | 8003 | 2 | .00000 | | EM18055 |
| 1926- | 1 | 83 | 8002 | 2 | 1 0.30901 | 8003 | 3 | 2 0.58778 | | EM18056 |
| 1927- | 1 | 83 | 8002 | 3 | 2 0.95105 | 8003 | 4 | 1.00000 | | EM18057 |
| 1928- | 1 | 83 | 8002 | 3 | -1.000000001 | 8003 | 4 | 3-0.80901 | | EM18058 |
| 1929- | 1 | 83 | 8002 | 4 | 3 0.80901 | 8003 | 5 | .00000 | | EM18059 |
| 1930- | 1 | 83 | 8002 | 4 | -1.000000001 | 8003 | 6 | 4 0.58778 | | EM18060 |
| 1931- | 1 | 83 | 8002 | 5 | 4 0.95105 | 8003 | 6 | 1.00000 | | EM18061 |
| 1932- | 1 | 83 | 8002 | 5 | -1.000000001 | 8003 | 1 | 1-1.00000 | | EM18062 |
| 1933- | 1 | 83 | 8002 | 6 | 5 0.30901 | 8003 | 2 | .00000 | | EM18063 |
| 1934- | 1 | 83 | 8002 | 6 | -1.000000001 | 8003 | 3 | 2 0.95105 | | EM18064 |
| 1935- | 1 | 84 | 8002 | 1 | 6 0.80901 | 8003 | 4 | 1.00000 | | EM18065 |
| 1936- | 1 | 84 | 8002 | 1 | -1.000000001 | 8003 | 5 | 5-1.00000 | | EM18066 |
| 1937- | 1 | 84 | 8002 | 2 | 1 0.30901 | 8003 | 6 | .00000 | | EM18067 |
| 1938- | 1 | 84 | 8002 | 2 | -1.000000001 | 8003 | 1 | 6 0.95105 | | EM18068 |
| 1939- | 1 | 84 | 8002 | 3 | 2 0.80901 | 8003 | 2 | 1.00000 | | EM18069 |
| 1940- | 1 | 84 | 8002 | 3 | -1.000000001 | 8003 | 3 | 2 0.30901 | | EM18070 |
| 1941- | 1 | 84 | 8002 | 4 | 3 0.95105 | 8003 | 4 | 3-1.00000 | | EM18071 |
| 1942- | 1 | 84 | 8002 | 4 | -1.000000001 | 8003 | 5 | .00000 | | EM18072 |
| 1943- | 1 | 84 | 8002 | 5 | 4 1.00000 | 8003 | 6 | 4 0.80901 | | EM18073 |
| 1944- | 1 | 84 | 8002 | 5 | -1.000000001 | 8003 | 1 | 1.00000 | | EM18074 |
| 1945- | 1 | 84 | 8002 | 6 | 5 0.30901 | 8003 | 2 | 5-1.00000 | | EM18075 |
| 1946- | 1 | 84 | 8002 | 6 | -1.000000001 | 8003 | 3 | .00000 | | EM18076 |
| 1947- | 1 | 84 | 8002 | 1 | 6 1.00000 | 8003 | 4 | 6 0.95105 | | EM18077 |
| 1948- | 1 | 85 | 8002 | 1 | -1.000000001 | 8003 | 5 | 1.00000 | | EM18078 |
| 1949- | 1 | 85 | 8002 | 2 | 1-0.30901 | 8003 | 6 | 6 0.80901 | | EM18079 |
| 1950- | 1 | 85 | 8002 | 2 | 1 0.30901 | 8003 | 1 | 1-0.80901 | | EM18080 |

SORTED BULK DATA ECHO

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---|----|------|---|--------------|------|--------|-----------|-----------|----|
| COUNT | 1 | 85 | 8002 | 2 | -1.000000001 | 2 | .00000 | 2-0.5E778 | 2M18072 | |
| 1951- | 1 | | 8002 | 2 | 2 0.95105 | 8003 | 3 | 1.00000 | 2M18073 | |
| 1952- | 1 | | 8002 | 3 | -1.000008001 | 8003 | 4 | 3-0.80901 | 2M18074 | |
| 1953- | 1 | | 8002 | 4 | -1.000008001 | 8003 | 5 | 4-0.5E778 | 2M18075 | |
| 1954- | 1 | | 8002 | 5 | -1.000008001 | 8003 | 6 | 5-0.80901 | 2M18076 | |
| 1955- | 1 | | 8002 | 6 | 6 0.95105 | 8003 | 1 | 1.00000 | 2M18081 | |
| 1956- | 1 | | 8002 | 1 | -1.000008001 | 8003 | 2 | .00000 | 2M18082 | |
| 1957- | 1 | | 8002 | 2 | 2 0.80901 | 8003 | 3 | 1.00000 | 2M18083 | |
| 1958- | 1 | | 8002 | 3 | -1.000008001 | 8003 | 4 | .00000 | 2M18084 | |
| 1959- | 1 | | 8002 | 4 | 4 0.80901 | 8003 | 5 | 4-0.95105 | 2M18085 | |
| 1960- | 1 | | 8002 | 5 | -1.000008001 | 8003 | 6 | 5-0.30901 | 2M18086 | |
| 1961- | 1 | | 8002 | 6 | 6 0.95105 | 8003 | 1 | 6-0.9E105 | 2M18091 | |
| 1962- | 1 | | 8002 | 1 | -1.000008001 | 8003 | 2 | 1.00000 | 2M18092 | |
| 1963- | 1 | | 8002 | 2 | 1-0.5E778 | 8003 | 3 | 2-0.5E105 | 2M18093 | |
| 1964- | 1 | | 8002 | 3 | -1.000008001 | 8003 | 4 | 3 0.30901 | 2M18094 | |
| 1965- | 1 | | 8002 | 4 | -1.000008001 | 8003 | 5 | 4-0.95105 | 2M18095 | |
| 1966- | 1 | | 8002 | 5 | 4 0.80901 | 8003 | 6 | 5 0.30901 | 2M18096 | |
| 1967- | 1 | | 8002 | 6 | -1.000008001 | 8003 | 1 | .00000 | 2M18101 | |
| 1968- | 1 | | 8002 | 1 | 2 0.5E778 | 8003 | 2 | 1.00000 | 2M18102 | |
| 1969- | 1 | | 8002 | 2 | -1.000008001 | 8003 | 3 | 2-0.5E778 | 2M18103 | |
| 1970- | 1 | | 8002 | 3 | 3-0.80901 | 8003 | 4 | 3 0.80901 | 2M18104 | |
| 1971- | 1 | | 8002 | 4 | -1.000008001 | 8003 | 5 | 4-0.5E778 | 2M18105 | |
| 1972- | 1 | | 8002 | 5 | 6 0.95105 | 8003 | 6 | 5 0.80901 | 2M18106 | |
| 1973- | 1 | | 8002 | 6 | -1.000008001 | 8003 | 1 | .00000 | 2M18111 | |
| 1974- | 1 | | 8002 | 1 | 1-0.5E778 | 8003 | 2 | 6-0.5E778 | 2M18112 | |
| 1975- | 1 | | 8002 | 2 | -1.000008001 | 8003 | 3 | 1.00000 | 2-0.00000 | |
| 1976- | 1 | | 8002 | 3 | 2 0.80901 | 8003 | 4 | 2-0.00000 | | |
| 1977- | 1 | | 8002 | 4 | -1.000008001 | 8003 | 5 | 3 0.30901 | | |
| 1978- | 1 | | 8002 | 5 | 3-0.80901 | 8003 | 6 | 4-0.9E105 | | |
| 1979- | 1 | | 8002 | 6 | -1.000008001 | 8003 | 1 | 5 0.30901 | | |
| 1980- | 1 | | 8002 | 1 | 6 0.95105 | 8003 | 2 | 6-0.5E778 | | |
| 1981- | 1 | | 8002 | 2 | -1.000008001 | 8003 | 3 | 1.00000 | | |
| 1982- | 1 | | 8002 | 3 | 1-0.5E778 | 8003 | 4 | 2-0.5E105 | | |
| 1983- | 1 | | 8002 | 4 | -1.000008001 | 8003 | 5 | 3 0.30901 | | |
| 1984- | 1 | | 8002 | 5 | 2 0.5E778 | 8003 | 6 | 4-0.9E105 | | |
| 1985- | 1 | | 8002 | 6 | -1.000008001 | 8003 | 1 | 5 0.30901 | | |
| 1986- | 1 | | 8002 | 1 | 3-0.80901 | 8003 | 2 | 6-0.5E778 | | |
| 1987- | 1 | | 8002 | 2 | -1.000008001 | 8003 | 3 | 1.00000 | | |
| 1988- | 1 | | 8002 | 3 | 2 0.80901 | 8003 | 4 | 2-0.00000 | | |
| 1989- | 1 | | 8002 | 4 | -1.000008001 | 8003 | 5 | 3 0.30901 | | |
| 1990- | 1 | | 8002 | 5 | 3-0.80901 | 8003 | 6 | 4-0.9E105 | | |
| 1991- | 1 | | 8002 | 6 | -1.000008001 | 8003 | 1 | 5 0.30901 | | |
| 1992- | 1 | | 8002 | 1 | 6 0.95105 | 8003 | 2 | 6-0.5E778 | | |
| 1993- | 1 | | 8002 | 2 | -1.000008001 | 8003 | 3 | 1.00000 | | |
| 1994- | 1 | | 8002 | 3 | 1-0.5E778 | 8003 | 4 | 2-0.5E105 | | |
| 1995- | 1 | | 8002 | 4 | -1.000008001 | 8003 | 5 | 3 0.30901 | | |
| 1996- | 1 | | 8002 | 5 | 2 0.5E778 | 8003 | 6 | 4-0.9E105 | | |
| 1997- | 1 | | 8002 | 6 | -1.000008001 | 8003 | 1 | 5 0.30901 | | |
| 1998- | 1 | | 8002 | 1 | 3-0.80901 | 8003 | 2 | 6-0.5E778 | | |
| 1999- | 1 | | 8002 | 2 | -1.000008001 | 8003 | 3 | 1.00000 | | |
| 2000- | 1 | | 8002 | 3 | 2 0.80901 | 8003 | 4 | 2-0.00000 | | |

SORTED BULK DATA ECHO

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---|----|------|----|--------------|----|---------|----|---------|---------|
| COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 2001- | 1 | 89 | 8002 | 3 | -1.000000001 | 3 | 1.00000 | 3 | 1.00000 | 2M18113 |
| 2002- | 1 | 89 | 8002 | 4 | -1.000000001 | 4 | 1.00000 | 4 | 1.00000 | 2M18114 |
| 2003- | 1 | 89 | 8002 | 5 | -1.000000001 | 5 | 1.00000 | 5 | 1.00000 | 2M18115 |
| 2004- | 1 | 89 | 8002 | 6 | -1.000000001 | 6 | 1.00000 | 6 | 1.00000 | 2M18116 |
| 2005- | 1 | 89 | 8002 | 7 | -1.000000001 | 7 | 1.00000 | 7 | 1.00000 | 2M18117 |
| 2006- | 1 | 89 | 8002 | 8 | -1.000000001 | 8 | 1.00000 | 8 | 1.00000 | 2M18118 |
| 2007- | 1 | 89 | 8002 | 9 | -1.000000001 | 9 | 1.00000 | 9 | 1.00000 | 2M18119 |
| 2008- | 1 | 89 | 8002 | 10 | -1.000000001 | 10 | 1.00000 | 10 | 1.00000 | 2M18120 |
| 2009- | 1 | 89 | 8002 | 11 | -1.000000001 | 11 | 1.00000 | 11 | 1.00000 | 2M18121 |
| 2010- | 1 | 89 | 8002 | 12 | -1.000000001 | 12 | 1.00000 | 12 | 1.00000 | 2M18122 |
| 2011- | 1 | 89 | 8002 | 13 | -1.000000001 | 13 | 1.00000 | 13 | 1.00000 | 2M18123 |
| 2012- | 1 | 89 | 8002 | 14 | -1.000000001 | 14 | 1.00000 | 14 | 1.00000 | 2M18124 |
| 2013- | 1 | 89 | 8002 | 15 | -1.000000001 | 15 | 1.00000 | 15 | 1.00000 | 2M18125 |
| 2014- | 1 | 89 | 8002 | 16 | -1.000000001 | 16 | 1.00000 | 16 | 1.00000 | 2M18126 |
| 2015- | 1 | 89 | 8002 | 17 | -1.000000001 | 17 | 1.00000 | 17 | 1.00000 | 2M18127 |
| 2016- | 1 | 89 | 8002 | 18 | -1.000000001 | 18 | 1.00000 | 18 | 1.00000 | 2M18128 |
| 2017- | 1 | 89 | 8002 | 19 | -1.000000001 | 19 | 1.00000 | 19 | 1.00000 | 2M18129 |
| 2018- | 1 | 89 | 8002 | 20 | -1.000000001 | 20 | 1.00000 | 20 | 1.00000 | 2M18130 |
| 2019- | 1 | 89 | 8002 | 21 | -1.000000001 | 21 | 1.00000 | 21 | 1.00000 | 2M18131 |
| 2020- | 1 | 89 | 8002 | 22 | -1.000000001 | 22 | 1.00000 | 22 | 1.00000 | 2M18132 |
| 2021- | 1 | 89 | 8002 | 23 | -1.000000001 | 23 | 1.00000 | 23 | 1.00000 | 2M18133 |
| 2022- | 1 | 89 | 8002 | 24 | -1.000000001 | 24 | 1.00000 | 24 | 1.00000 | 2M18134 |
| 2023- | 1 | 89 | 8002 | 25 | -1.000000001 | 25 | 1.00000 | 25 | 1.00000 | 2M18135 |
| 2024- | 1 | 89 | 8002 | 26 | -1.000000001 | 26 | 1.00000 | 26 | 1.00000 | 2M18136 |
| 2025- | 1 | 89 | 8002 | 27 | -1.000000001 | 27 | 1.00000 | 27 | 1.00000 | 2M18137 |
| 2026- | 1 | 89 | 8002 | 28 | -1.000000001 | 28 | 1.00000 | 28 | 1.00000 | 2M18138 |
| 2027- | 1 | 89 | 8002 | 29 | -1.000000001 | 29 | 1.00000 | 29 | 1.00000 | 2M18139 |
| 2028- | 1 | 89 | 8002 | 30 | -1.000000001 | 30 | 1.00000 | 30 | 1.00000 | 2M18140 |
| 2029- | 1 | 89 | 8002 | 31 | -1.000000001 | 31 | 1.00000 | 31 | 1.00000 | 2M18141 |
| 2030- | 1 | 89 | 8002 | 32 | -1.000000001 | 32 | 1.00000 | 32 | 1.00000 | 2M18142 |
| 2031- | 1 | 89 | 8002 | 33 | -1.000000001 | 33 | 1.00000 | 33 | 1.00000 | 2M18143 |
| 2032- | 1 | 89 | 8002 | 34 | -1.000000001 | 34 | 1.00000 | 34 | 1.00000 | 2M18144 |
| 2033- | 1 | 89 | 8002 | 35 | -1.000000001 | 35 | 1.00000 | 35 | 1.00000 | 2M18145 |
| 2034- | 1 | 89 | 8002 | 36 | -1.000000001 | 36 | 1.00000 | 36 | 1.00000 | 2M18146 |
| 2035- | 1 | 89 | 8002 | 37 | -1.000000001 | 37 | 1.00000 | 37 | 1.00000 | 2M18147 |
| 2036- | 1 | 89 | 8002 | 38 | -1.000000001 | 38 | 1.00000 | 38 | 1.00000 | 2M18148 |
| 2037- | 1 | 89 | 8002 | 39 | -1.000000001 | 39 | 1.00000 | 39 | 1.00000 | 2M18149 |
| 2038- | 1 | 89 | 8002 | 40 | -1.000000001 | 40 | 1.00000 | 40 | 1.00000 | 2M18150 |
| 2039- | 1 | 89 | 8002 | 41 | -1.000000001 | 41 | 1.00000 | 41 | 1.00000 | 2M18151 |
| 2040- | 1 | 89 | 8002 | 42 | -1.000000001 | 42 | 1.00000 | 42 | 1.00000 | 2M18152 |
| 2041- | 1 | 89 | 8002 | 43 | -1.000000001 | 43 | 1.00000 | 43 | 1.00000 | 2M18153 |
| 2042- | 1 | 89 | 8002 | 44 | -1.000000001 | 44 | 1.00000 | 44 | 1.00000 | 2M18154 |
| 2043- | 1 | 89 | 8002 | 45 | -1.000000001 | 45 | 1.00000 | 45 | 1.00000 | 2M18155 |
| 2044- | 1 | 89 | 8002 | 46 | -1.000000001 | 46 | 1.00000 | 46 | 1.00000 | 2M18156 |
| 2045- | 1 | 89 | 8002 | 47 | -1.000000001 | 47 | 1.00000 | 47 | 1.00000 | 2M18157 |
| 2046- | 1 | 89 | 8002 | 48 | -1.000000001 | 48 | 1.00000 | 48 | 1.00000 | 2M18158 |
| 2047- | 1 | 89 | 8002 | 49 | -1.000000001 | 49 | 1.00000 | 49 | 1.00000 | 2M18159 |
| 2048- | 1 | 89 | 8002 | 50 | -1.000000001 | 50 | 1.00000 | 50 | 1.00000 | 2M18160 |
| 2049- | 1 | 89 | 8002 | 51 | -1.000000001 | 51 | 1.00000 | 51 | 1.00000 | 2M18161 |
| 2050- | 1 | 89 | 8002 | 52 | -1.000000001 | 52 | 1.00000 | 52 | 1.00000 | 2M18162 |

ORIGINAL PAGE IS
OF POOR QUALITY

APRIL 11, 1974 NASIRAN 5/13/72

AXISMETRIC CIRC. CYL. WITH FLUID
HARMONIC REDUCTION

SORTED BULK DATA ECHO

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---|----|------|---|--------------|------|---------|-----------|---|----|
| 2051- | 1 | 93 | 4 | 4 | -1.000000001 | 4 | 4 | 0.00000 | 9 | 10 |
| 2052- | 1 | 93 | 9002 | 5 | 4 0.80901 | 9003 | 4 | 0.95105 | 9 | 10 |
| 2053- | 1 | 93 | 9002 | 5 | -1.000000001 | 5 | 1.00000 | 1.00000 | 9 | 10 |
| 2054- | 1 | 93 | 9002 | 6 | 5 0.58778 | 9003 | 5 | 5-0.30901 | 9 | 10 |
| 2055- | 1 | 93 | 9002 | 6 | -1.000000001 | 6 | 0.00000 | 0.00000 | 9 | 10 |
| 2056- | 1 | 94 | 9002 | 1 | 6 0.80901 | 9003 | 6 | 0.95105 | 9 | 10 |
| 2057- | 1 | 94 | 9002 | 1 | -1.000000001 | 1 | 1.00000 | 1.00000 | 9 | 10 |
| 2058- | 1 | 94 | 9002 | 2 | 1 0.30901 | 9003 | 1 | 0.80901 | 9 | 10 |
| 2059- | 1 | 94 | 9002 | 2 | -1.000000001 | 2 | 0.00000 | 0.00000 | 9 | 10 |
| 2060- | 1 | 94 | 9002 | 3 | 2 0.95105 | 9003 | 2 | 0.58778 | 9 | 10 |
| 2061- | 1 | 94 | 9002 | 3 | -1.000000001 | 3 | 1.00000 | 1.00000 | 9 | 10 |
| 2062- | 1 | 94 | 9002 | 4 | 3 0.30901 | 9003 | 3 | 0.80901 | 9 | 10 |
| 2063- | 1 | 94 | 9002 | 4 | -1.000000001 | 4 | 0.00000 | 0.00000 | 9 | 10 |
| 2064- | 1 | 94 | 9002 | 5 | 4 0.95105 | 9003 | 4 | 0.58778 | 9 | 10 |
| 2065- | 1 | 94 | 9002 | 5 | -1.000000001 | 5 | 1.00000 | 1.00000 | 9 | 10 |
| 2066- | 1 | 94 | 9002 | 6 | 5 0.30901 | 9003 | 5 | 0.80901 | 9 | 10 |
| 2067- | 1 | 94 | 9002 | 6 | -1.000000001 | 6 | 0.00000 | 0.00000 | 9 | 10 |
| 2068- | 1 | 95 | 9002 | 1 | 6 0.95105 | 9003 | 6 | 0.58778 | 9 | 10 |
| 2069- | 1 | 95 | 9002 | 1 | -1.000000001 | 1 | 1.00000 | 1.00000 | 9 | 10 |
| 2070- | 1 | 95 | 9002 | 2 | 1 0.00000 | 9003 | 1 | 1.00000 | 9 | 10 |
| 2071- | 1 | 95 | 9002 | 2 | -1.000000001 | 2 | 0.00000 | 0.00000 | 9 | 10 |
| 2072- | 1 | 95 | 9002 | 3 | 2 1.00000 | 9003 | 2 | 0.00000 | 9 | 10 |
| 2073- | 1 | 95 | 9002 | 3 | 3 0.00000 | 9003 | 3 | 1.00000 | 9 | 10 |
| 2074- | 1 | 95 | 9002 | 4 | -1.000000001 | 4 | 0.00000 | 0.00000 | 9 | 10 |
| 2075- | 1 | 95 | 9002 | 4 | 4 1.00000 | 9003 | 4 | 0.00000 | 9 | 10 |
| 2076- | 1 | 95 | 9002 | 5 | -1.000000001 | 5 | 1.00000 | 1.00000 | 9 | 10 |
| 2077- | 1 | 95 | 9002 | 5 | 5 0.00000 | 9003 | 5 | 1.00000 | 9 | 10 |
| 2078- | 1 | 95 | 9002 | 6 | -1.000000001 | 6 | 0.00000 | 0.00000 | 9 | 10 |
| 2079- | 1 | 95 | 9002 | 6 | 6 1.00000 | 9003 | 6 | 0.00000 | 9 | 10 |
| 2080- | 1 | 96 | 9002 | 1 | -1.000000001 | 1 | 1.00000 | 1.00000 | 9 | 10 |
| 2081- | 1 | 96 | 9002 | 1 | 1 0.30901 | 9003 | 1 | 0.80901 | 9 | 10 |
| 2082- | 1 | 96 | 9002 | 2 | -1.000000001 | 2 | 0.00000 | 0.00000 | 9 | 10 |
| 2083- | 1 | 96 | 9002 | 2 | 2 0.95105 | 9003 | 2 | 0.58778 | 9 | 10 |
| 2084- | 1 | 96 | 9002 | 3 | -1.000000001 | 3 | 1.00000 | 1.00000 | 9 | 10 |
| 2085- | 1 | 96 | 9002 | 3 | 3 0.30901 | 9003 | 3 | 0.80901 | 9 | 10 |
| 2086- | 1 | 96 | 9002 | 4 | -1.000000001 | 4 | 0.00000 | 0.00000 | 9 | 10 |
| 2087- | 1 | 96 | 9002 | 4 | 4 0.95105 | 9003 | 4 | 0.58778 | 9 | 10 |
| 2088- | 1 | 96 | 9002 | 5 | -1.000000001 | 5 | 1.00000 | 1.00000 | 9 | 10 |
| 2089- | 1 | 96 | 9002 | 5 | 5 0.30901 | 9003 | 5 | 0.80901 | 9 | 10 |
| 2090- | 1 | 96 | 9002 | 6 | -1.000000001 | 6 | 0.00000 | 0.00000 | 9 | 10 |
| 2091- | 1 | 96 | 9002 | 6 | 6 0.95105 | 9003 | 6 | 0.58778 | 9 | 10 |
| 2092- | 1 | 97 | 9002 | 1 | -1.000000001 | 1 | 1.00000 | 1.00000 | 9 | 10 |
| 2093- | 1 | 97 | 9002 | 2 | 1 0.58778 | 9003 | 1 | 0.00000 | 9 | 10 |
| 2094- | 1 | 97 | 9002 | 2 | -1.000000001 | 2 | 0.00000 | 0.00000 | 9 | 10 |
| 2095- | 1 | 97 | 9002 | 3 | 2 0.80901 | 9003 | 2 | 0.95105 | 9 | 10 |
| 2096- | 1 | 97 | 9002 | 3 | -1.000000001 | 3 | 1.00000 | 1.00000 | 9 | 10 |
| 2097- | 1 | 97 | 9002 | 4 | 3 0.58778 | 9003 | 3 | 0.30901 | 9 | 10 |
| 2098- | 1 | 97 | 9002 | 4 | -1.000000001 | 4 | 0.00000 | 0.00000 | 9 | 10 |
| 2099- | 1 | 97 | 9002 | 4 | 4 0.80901 | 9003 | 4 | 0.95105 | 9 | 10 |
| 2100- | 1 | 97 | 9002 | 4 | -1.000000001 | 4 | 0.00000 | 0.00000 | 9 | 10 |

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ASYMMETRIC CIRC. CYL. WITH FLUID
HARMONIC REDUCTION

SORTED BULK DATA ECHO

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---------|----|------|-------|--------------|---------|---------|---------|---------|---------|
| COUNT | 1 | 97 | 9002 | 5 | 5 | 6 | 7 | 8 | 9 | 10 |
| 2101- | MPC | 1 | 97 | 5 | -1.000000001 | 5 | 1.00000 | 5 | 1.00000 | CM19085 |
| 2102- | CM19085 | 1 | 97 | 9002 | 5 | 0.58778 | 9003 | 5 | 0.30901 | CM19086 |
| 2103- | MPC | 1 | 97 | 6 | -1.000000001 | 6 | .00000 | 6 | 0.95105 | CM19091 |
| 2104- | CM19086 | 1 | 98 | 9002 | 1 | 0.80901 | 9003 | 1 | 1.00000 | CM19092 |
| 2105- | MPC | 1 | 98 | 1 | -1.000000001 | 1 | 0.00000 | 1 | 0.00000 | CM19093 |
| 2106- | CM19091 | 1 | 98 | 9002 | 2 | 0.80901 | 9003 | 2 | 0.95105 | CM19094 |
| 2107- | MPC | 1 | 98 | 2 | -1.000000001 | 2 | .00000 | 2 | 0.95105 | CM19095 |
| 2108- | CM19092 | 1 | 98 | 9002 | 3 | 0.58778 | 9003 | 3 | 1.00000 | CM19096 |
| 2109- | MPC | 1 | 98 | 3 | -1.000000001 | 3 | 1.00000 | 3 | 0.30901 | CM19101 |
| 2110- | CM19093 | 1 | 98 | 9002 | 4 | 0.80901 | 9003 | 4 | .00000 | CM19102 |
| 2111- | MPC | 1 | 98 | 4 | -1.000000001 | 4 | .00000 | 4 | 0.55105 | CM19103 |
| 2112- | CM19094 | 1 | 98 | 9002 | 5 | 0.58778 | 9003 | 5 | 1.00000 | CM19104 |
| 2113- | MPC | 1 | 98 | 5 | -1.000000001 | 5 | 1.00000 | 5 | 0.30901 | CM19105 |
| 2114- | CM19095 | 1 | 98 | 9002 | 6 | 0.80901 | 9003 | 6 | .00000 | CM19106 |
| 2115- | MPC | 1 | 98 | 6 | -1.000000001 | 6 | 0.95105 | 6 | 0.58778 | CM19111 |
| 2116- | CM19096 | 1 | 99 | 9002 | 1 | 0.58778 | 9003 | 1 | 1.00000 | CM19112 |
| 2117- | MPC | 1 | 99 | 1 | -1.000000001 | 1 | 1.00000 | 1 | 0.80901 | CM19113 |
| 2118- | CM19101 | 1 | 99 | 9002 | 2 | 0.95105 | 9003 | 2 | 0.58778 | CM19114 |
| 2119- | MPC | 1 | 99 | 2 | -1.000000001 | 2 | .00000 | 2 | 0.58778 | CM19115 |
| 2120- | CM19102 | 1 | 99 | 9002 | 3 | 0.30901 | 9003 | 3 | 1.00000 | CM19116 |
| 2121- | MPC | 1 | 99 | 3 | -1.000000001 | 3 | 1.00000 | 3 | 0.30901 | CM19117 |
| 2122- | CM19103 | 1 | 99 | 9002 | 4 | 0.95105 | 9003 | 4 | .00000 | CM19118 |
| 2123- | MPC | 1 | 99 | 4 | -1.000000001 | 4 | .00000 | 4 | 0.58778 | CM19119 |
| 2124- | CM19104 | 1 | 99 | 9002 | 5 | 0.30901 | 9003 | 5 | 1.00000 | CM19120 |
| 2125- | MPC | 1 | 99 | 5 | -1.000000001 | 5 | 1.00000 | 5 | 0.80901 | CM19121 |
| 2126- | CM19105 | 1 | 99 | 9002 | 6 | 0.95105 | 9003 | 6 | .00000 | CM19122 |
| 2127- | MPC | 1 | 99 | 6 | -1.000000001 | 6 | .00000 | 6 | 0.58778 | CM19123 |
| 2128- | CM19106 | 1 | 100 | 9002 | 1 | 0.30901 | 9003 | 1 | 1.00000 | CM19124 |
| 2129- | MPC | 1 | 100 | 1 | -1.000000001 | 1 | 1.00000 | 1 | 0.80901 | CM19125 |
| 2130- | CM19111 | 1 | 100 | 9002 | 2 | 0.95105 | 9003 | 2 | 0.58778 | CM19126 |
| 2131- | MPC | 1 | 100 | 2 | -1.000000001 | 2 | .00000 | 2 | 0.58778 | CM19127 |
| 2132- | CM19112 | 1 | 100 | 9002 | 3 | 0.30901 | 9003 | 3 | 1.00000 | CM19128 |
| 2133- | MPC | 1 | 100 | 3 | -1.000000001 | 3 | 1.00000 | 3 | 0.30901 | CM19129 |
| 2134- | CM19113 | 1 | 100 | 9002 | 4 | 0.95105 | 9003 | 4 | .00000 | CM19130 |
| 2135- | MPC | 1 | 100 | 4 | -1.000000001 | 4 | .00000 | 4 | 0.58778 | CM19131 |
| 2136- | CM19114 | 1 | 100 | 9002 | 5 | 0.30901 | 9003 | 5 | 1.00000 | CM19132 |
| 2137- | MPC | 1 | 100 | 5 | -1.000000001 | 5 | 1.00000 | 5 | 0.80901 | CM19133 |
| 2138- | CM19115 | 1 | 100 | 9002 | 6 | 0.95105 | 9003 | 6 | .00000 | CM19134 |
| 2139- | MPC | 1 | 100 | 6 | -1.000000001 | 6 | .00000 | 6 | 0.58778 | CM19135 |
| 2140- | CM19116 | 1 | 101 | 9002 | 1 | 0.30901 | 9003 | 1 | 1.00000 | CM19136 |
| 2141- | MPC | 1 | 101 | 1 | -1.000000001 | 1 | 1.00000 | 1 | 0.80901 | CM19137 |
| 2142- | CM20011 | 1 | 101 | 10002 | 2 | 0.95105 | 10003 | 2 | 0.58778 | CM20012 |
| 2143- | MPC | 1 | 101 | 2 | -1.000000001 | 2 | .00000 | 2 | 0.58778 | CM20013 |
| 2144- | CM20012 | 1 | 101 | 10002 | 3 | 0.30901 | 10003 | 3 | 1.00000 | CM20014 |
| 2145- | MPC | 1 | 101 | 3 | -1.000000001 | 3 | 1.00000 | 3 | 0.30901 | CM20015 |
| 2146- | CM20013 | 1 | 101 | 10002 | 4 | 0.95105 | 10003 | 4 | .00000 | CM20016 |
| 2147- | MPC | 1 | 101 | 4 | -1.000000001 | 4 | .00000 | 4 | 0.58778 | CM20017 |
| 2148- | CM20014 | 1 | 101 | 10002 | 5 | 0.30901 | 10003 | 5 | 1.00000 | CM20018 |
| 2149- | MPC | 1 | 101 | 5 | -1.000000001 | 5 | 1.00000 | 5 | 0.80901 | CM20019 |
| 2150- | CM20015 | 1 | 1002 | 5 | 1.00000 | 10003 | 5 | 1.00000 | 5 | 1.00000 |

SORTED BULK DATA ECHO

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---|-----|-------|---|----------|-------|---|---------|---|---------|
| 2151- | 1 | 101 | 10002 | 6 | -1.00000 | 10001 | 6 | .00000 | | EM20016 |
| 2152- | 1 | 102 | 10002 | 1 | -1.00000 | 10001 | 1 | 1.00000 | | EM20021 |
| 2153- | 1 | 102 | 10002 | 2 | -1.00000 | 10001 | 2 | .00000 | | EM20022 |
| 2154- | 1 | 102 | 10002 | 3 | -1.00000 | 10001 | 3 | 1.00000 | | EM20023 |
| 2155- | 1 | 102 | 10002 | 4 | -1.00000 | 10001 | 4 | .00000 | | EM20024 |
| 2156- | 1 | 102 | 10002 | 5 | -1.00000 | 10001 | 5 | 1.00000 | | EM20025 |
| 2157- | 1 | 102 | 10002 | 6 | -1.00000 | 10001 | 6 | .00000 | | EM20026 |
| 2158- | 1 | 103 | 10002 | 1 | -1.00000 | 10001 | 1 | 1.00000 | | EM20031 |
| 2159- | 1 | 103 | 10002 | 2 | -1.00000 | 10001 | 2 | .00000 | | EM20032 |
| 2160- | 1 | 103 | 10002 | 3 | -1.00000 | 10001 | 3 | 1.00000 | | EM20033 |
| 2161- | 1 | 103 | 10002 | 4 | -1.00000 | 10001 | 4 | .00000 | | EM20034 |
| 2162- | 1 | 103 | 10002 | 5 | -1.00000 | 10001 | 5 | 1.00000 | | EM20035 |
| 2163- | 1 | 103 | 10002 | 6 | -1.00000 | 10001 | 6 | .00000 | | EM20036 |
| 2164- | 1 | 104 | 10002 | 1 | -1.00000 | 10001 | 1 | 1.00000 | | EM20041 |
| 2165- | 1 | 104 | 10002 | 2 | -1.00000 | 10001 | 2 | .00000 | | EM20042 |
| 2166- | 1 | 104 | 10002 | 3 | -1.00000 | 10001 | 3 | 1.00000 | | EM20043 |
| 2167- | 1 | 104 | 10002 | 4 | -1.00000 | 10001 | 4 | .00000 | | EM20044 |
| 2168- | 1 | 104 | 10002 | 5 | -1.00000 | 10001 | 5 | 1.00000 | | EM20045 |
| 2169- | 1 | 104 | 10002 | 6 | -1.00000 | 10001 | 6 | .00000 | | EM20046 |
| 2170- | 1 | 105 | 10002 | 1 | -1.00000 | 10001 | 1 | 1.00000 | | EM20051 |
| 2171- | 1 | 105 | 10002 | 2 | -1.00000 | 10001 | 2 | .00000 | | EM20052 |
| 2172- | 1 | 105 | 10002 | 3 | -1.00000 | 10001 | 3 | 1.00000 | | EM20053 |
| 2173- | 1 | 105 | 10002 | 4 | -1.00000 | 10001 | 4 | .00000 | | EM20054 |
| 2174- | 1 | 105 | 10002 | 5 | -1.00000 | 10001 | 5 | 1.00000 | | EM20055 |
| 2175- | 1 | 105 | 10002 | 6 | -1.00000 | 10001 | 6 | .00000 | | EM20056 |

SORTED BULK DATA ECHO

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---|-----|-------|---|----------|-------|---|---------|---|---------|
| COUNT | 1 | 106 | 10002 | 1 | -1.00000 | 10001 | 1 | 1.00000 | | EM20061 |
| 2201- | 1 | 106 | 10002 | 1 | 1.00000 | 10003 | 1 | 1.00000 | | EM20062 |
| 2202- | 1 | 106 | 10002 | 2 | -1.00000 | 10001 | 2 | 0.00000 | | EM20063 |
| 2203- | 1 | 106 | 10002 | 3 | -1.00000 | 10001 | 3 | 1.00000 | | EM20064 |
| 2204- | 1 | 106 | 10002 | 4 | 1.00000 | 10003 | 4 | 0.00000 | | EM20065 |
| 2205- | 1 | 106 | 10002 | 5 | -1.00000 | 10001 | 5 | 1.00000 | | EM20066 |
| 2206- | 1 | 106 | 10002 | 6 | -1.00000 | 10001 | 6 | 0.00000 | | EM20067 |
| 2207- | 1 | 106 | 10002 | 1 | 1.00000 | 10003 | 1 | 1.00000 | | EM20068 |
| 2208- | 1 | 106 | 10002 | 2 | -1.00000 | 10001 | 2 | 0.00000 | | EM20069 |
| 2209- | 1 | 106 | 10002 | 3 | -1.00000 | 10001 | 3 | 1.00000 | | EM20070 |
| 2210- | 1 | 106 | 10002 | 4 | 1.00000 | 10003 | 4 | 0.00000 | | EM20071 |
| 2211- | 1 | 106 | 10002 | 5 | -1.00000 | 10001 | 5 | 1.00000 | | EM20072 |
| 2212- | 1 | 106 | 10002 | 6 | -1.00000 | 10001 | 6 | 0.00000 | | EM20073 |
| 2213- | 1 | 107 | 10002 | 1 | 1.00000 | 10003 | 1 | 1.00000 | | EM20074 |
| 2214- | 1 | 107 | 10002 | 2 | -1.00000 | 10001 | 2 | 0.00000 | | EM20075 |
| 2215- | 1 | 107 | 10002 | 3 | -1.00000 | 10001 | 3 | 1.00000 | | EM20076 |
| 2216- | 1 | 107 | 10002 | 4 | 1.00000 | 10003 | 4 | 0.00000 | | EM20077 |
| 2217- | 1 | 107 | 10002 | 5 | -1.00000 | 10001 | 5 | 1.00000 | | EM20078 |
| 2218- | 1 | 107 | 10002 | 6 | -1.00000 | 10001 | 6 | 0.00000 | | EM20079 |
| 2219- | 1 | 107 | 10002 | 1 | 1.00000 | 10003 | 1 | 1.00000 | | EM20080 |
| 2220- | 1 | 107 | 10002 | 2 | -1.00000 | 10001 | 2 | 0.00000 | | EM20081 |
| 2221- | 1 | 107 | 10002 | 3 | -1.00000 | 10001 | 3 | 1.00000 | | EM20082 |
| 2222- | 1 | 107 | 10002 | 4 | 1.00000 | 10003 | 4 | 0.00000 | | EM20083 |
| 2223- | 1 | 107 | 10002 | 5 | -1.00000 | 10001 | 5 | 1.00000 | | EM20084 |
| 2224- | 1 | 107 | 10002 | 6 | -1.00000 | 10001 | 6 | 0.00000 | | EM20085 |
| 2225- | 1 | 108 | 10002 | 1 | 1.00000 | 10003 | 1 | 1.00000 | | EM20086 |
| 2226- | 1 | 108 | 10002 | 2 | -1.00000 | 10001 | 2 | 0.00000 | | EM20087 |
| 2227- | 1 | 108 | 10002 | 3 | -1.00000 | 10001 | 3 | 1.00000 | | EM20088 |
| 2228- | 1 | 108 | 10002 | 4 | 1.00000 | 10003 | 4 | 0.00000 | | EM20089 |
| 2229- | 1 | 108 | 10002 | 5 | -1.00000 | 10001 | 5 | 1.00000 | | EM20090 |
| 2230- | 1 | 108 | 10002 | 6 | -1.00000 | 10001 | 6 | 0.00000 | | EM20091 |
| 2231- | 1 | 108 | 10002 | 1 | 1.00000 | 10003 | 1 | 1.00000 | | EM20092 |
| 2232- | 1 | 108 | 10002 | 2 | -1.00000 | 10001 | 2 | 0.00000 | | EM20093 |
| 2233- | 1 | 108 | 10002 | 3 | -1.00000 | 10001 | 3 | 1.00000 | | EM20094 |
| 2234- | 1 | 108 | 10002 | 4 | 1.00000 | 10003 | 4 | 0.00000 | | EM20095 |
| 2235- | 1 | 108 | 10002 | 5 | -1.00000 | 10001 | 5 | 1.00000 | | EM20096 |
| 2236- | 1 | 108 | 10002 | 6 | -1.00000 | 10001 | 6 | 0.00000 | | EM20097 |
| 2237- | 1 | 109 | 10002 | 1 | 1.00000 | 10003 | 1 | 1.00000 | | EM20098 |
| 2238- | 1 | 109 | 10002 | 2 | -1.00000 | 10001 | 2 | 0.00000 | | EM20099 |
| 2239- | 1 | 109 | 10002 | 3 | -1.00000 | 10001 | 3 | 1.00000 | | EM20100 |
| 2240- | 1 | 109 | 10002 | 4 | 1.00000 | 10003 | 4 | 0.00000 | | EM20101 |
| 2241- | 1 | 109 | 10002 | 5 | -1.00000 | 10001 | 5 | 1.00000 | | EM20102 |
| 2242- | 1 | 109 | 10002 | 6 | -1.00000 | 10001 | 6 | 0.00000 | | EM20103 |
| 2243- | 1 | 109 | 10002 | 1 | 1.00000 | 10003 | 1 | 1.00000 | | EM20104 |
| 2244- | 1 | 109 | 10002 | 2 | -1.00000 | 10001 | 2 | 0.00000 | | EM20105 |
| 2245- | 1 | 109 | 10002 | 3 | -1.00000 | 10001 | 3 | 1.00000 | | EM20106 |
| 2246- | 1 | 109 | 10002 | 4 | 1.00000 | 10003 | 4 | 0.00000 | | EM20107 |
| 2247- | 1 | 109 | 10002 | 5 | -1.00000 | 10001 | 5 | 1.00000 | | EM20108 |
| 2248- | 1 | 109 | 10002 | 6 | -1.00000 | 10001 | 6 | 0.00000 | | EM20109 |
| 2249- | 1 | 110 | 10002 | 1 | 1.00000 | 10003 | 1 | 1.00000 | | EM20110 |
| 2250- | 1 | 110 | 10002 | 2 | -1.00000 | 10001 | 2 | 0.00000 | | EM20111 |

ORIGINAL PAGE IS
OF POOR QUALITY

APRIL 11, 1974 NASTRAN 5/13/72

AXISYMMETRIC CIRC. CYL. WITH FLUID

HARMONIC REDUCTION

SORTED BULK DATA ECHO

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---|-----|-------|----------|---------|-------|-----------|---|---|---------|
| 2251- | 1 | 110 | 2 | -1.00000 | 10001 | 2 | .00000 | | | CM20102 |
| 2252- | 1 | 110 | 10002 | 2 | 0.30901 | 10003 | 2-0.52778 | | | CM20103 |
| 2253- | 1 | 110 | 3 | -1.00000 | 10001 | 3 | 1.00000 | | | CM20104 |
| 2254- | 1 | 110 | 10002 | 3 | 0.95105 | 10003 | 3 0.80901 | | | CM20105 |
| 2255- | 1 | 110 | 4 | -1.00000 | 10001 | 4 | .00000 | | | CM20106 |
| 2256- | 1 | 110 | 10002 | 4 | 0.30901 | 10003 | 4-0.52778 | | | CM20107 |
| 2257- | 1 | 110 | 5 | -1.00000 | 10001 | 5 | 1.00000 | | | CM20108 |
| 2258- | 1 | 110 | 10002 | 5 | 0.95105 | 10003 | 5 0.80901 | | | CM20109 |
| 2259- | 1 | 110 | 6 | -1.00000 | 10001 | 6 | .00000 | | | CM20110 |
| 2260- | 1 | 110 | 10002 | 6 | 0.30901 | 10003 | 6-0.52778 | | | CM20111 |
| 2261- | 1 | 111 | 1 | -1.00000 | 10001 | 1 | 1.00000 | | | CM20112 |
| 2262- | 1 | 111 | 10002 | 1 | 1.00000 | 10003 | 1 1.00000 | | | CM20113 |
| 2263- | 1 | 111 | 2 | -1.00000 | 10001 | 2 | .00000 | | | CM20114 |
| 2264- | 1 | 111 | 10002 | 2 | 0.30901 | 10003 | 2-0.52778 | | | CM20115 |
| 2265- | 1 | 111 | 3 | -1.00000 | 10001 | 3 | 1.00000 | | | CM20116 |
| 2266- | 1 | 111 | 10002 | 3 | 1.00000 | 10003 | 3 1.00000 | | | CM20117 |
| 2267- | 1 | 111 | 4 | -1.00000 | 10001 | 4 | .00000 | | | CM20118 |
| 2268- | 1 | 111 | 10002 | 4 | 0.30901 | 10003 | 4-0.52778 | | | CM20119 |
| 2269- | 1 | 111 | 5 | -1.00000 | 10001 | 5 | 1.00000 | | | CM20120 |
| 2270- | 1 | 111 | 10002 | 5 | 1.00000 | 10003 | 5 1.00000 | | | CM20121 |
| 2271- | 1 | 111 | 6 | -1.00000 | 10001 | 6 | .00000 | | | CM20122 |
| 2272- | 1 | 112 | 1 | -1.00000 | 10001 | 1 | 1.00000 | | | CM20123 |
| 2273- | 1 | 112 | 10002 | 1 | 1.00000 | 10003 | 1 1.00000 | | | CM20124 |
| 2274- | 1 | 112 | 2 | -1.00000 | 10001 | 2 | .00000 | | | CM20125 |
| 2275- | 1 | 112 | 10002 | 2 | 0.30901 | 10003 | 2-0.52778 | | | CM20126 |
| 2276- | 1 | 112 | 3 | -1.00000 | 10001 | 3 | 1.00000 | | | CM20127 |
| 2277- | 1 | 112 | 10002 | 3 | 1.00000 | 10003 | 3 1.00000 | | | CM20128 |
| 2278- | 1 | 112 | 4 | -1.00000 | 10001 | 4 | .00000 | | | CM20129 |
| 2279- | 1 | 112 | 10002 | 4 | 0.30901 | 10003 | 4-0.52778 | | | CM20130 |
| 2280- | 1 | 112 | 5 | -1.00000 | 10001 | 5 | 1.00000 | | | CM20131 |
| 2281- | 1 | 112 | 10002 | 5 | 1.00000 | 10003 | 5 1.00000 | | | CM20132 |
| 2282- | 1 | 112 | 6 | -1.00000 | 10001 | 6 | .00000 | | | CM20133 |
| 2283- | 1 | 112 | 10002 | 6 | 0.30901 | 10003 | 6-0.52778 | | | CM20134 |
| 2284- | 1 | 113 | 1 | -1.00000 | 10001 | 1 | 1.00000 | | | CM20135 |
| 2285- | 1 | 113 | 10002 | 1 | 1.00000 | 10003 | 1 1.00000 | | | CM20136 |
| 2286- | 1 | 113 | 2 | -1.00000 | 10001 | 2 | .00000 | | | CM20137 |
| 2287- | 1 | 113 | 10002 | 2 | 0.30901 | 10003 | 2-0.52778 | | | CM20138 |
| 2288- | 1 | 113 | 3 | -1.00000 | 10001 | 3 | 1.00000 | | | CM20139 |
| 2289- | 1 | 113 | 10002 | 3 | 1.00000 | 10003 | 3 1.00000 | | | CM20140 |
| 2290- | 1 | 113 | 4 | -1.00000 | 10001 | 4 | .00000 | | | CM20141 |
| 2291- | 1 | 113 | 10002 | 4 | 0.30901 | 10003 | 4-0.52778 | | | CM20142 |
| 2292- | 1 | 113 | 5 | -1.00000 | 10001 | 5 | 1.00000 | | | CM20143 |
| 2293- | 1 | 113 | 10002 | 5 | 1.00000 | 10003 | 5 1.00000 | | | CM20144 |
| 2294- | 1 | 113 | 6 | -1.00000 | 10001 | 6 | .00000 | | | CM20145 |
| 2295- | 1 | 113 | 10002 | 6 | 0.30901 | 10003 | 6-0.52778 | | | CM20146 |
| 2296- | 1 | 114 | 1 | -1.00000 | 10001 | 1 | 1.00000 | | | CM20147 |
| 2297- | 1 | 114 | 10002 | 1 | 1.00000 | 10003 | 1 1.00000 | | | CM20148 |
| 2298- | 1 | 114 | 2 | -1.00000 | 10001 | 2 | .00000 | | | CM20149 |
| 2299- | 1 | 114 | 10002 | 2 | 0.30901 | 10003 | 2-0.52778 | | | CM20150 |
| 2300- | 1 | 114 | 3 | -1.00000 | 10001 | 3 | 1.00000 | | | CM20151 |

SORTED BULK DATA ECHO

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---|-----|-------|---|----------|-------|---|---------|---|---------|
| COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 2301- | 1 | 114 | 11002 | 3 | -1.00000 | 11001 | 3 | 1.00000 | | EM21033 |
| 2302- | 1 | 114 | 11002 | 3 | 0.80901 | 11003 | 3 | 0.36901 | | EM21034 |
| 2303- | 1 | 114 | 11002 | 4 | -1.00000 | 11001 | 4 | .00000 | | EM21035 |
| 2304- | 1 | 114 | 11002 | 4 | 0.58778 | 11003 | 4 | 0.95105 | | EM21036 |
| 2305- | 1 | 114 | 11002 | 5 | -1.00000 | 11001 | 5 | 1.00000 | | EM21037 |
| 2306- | 1 | 114 | 11002 | 5 | 0.80901 | 11003 | 5 | 0.36901 | | EM21038 |
| 2307- | 1 | 114 | 11002 | 6 | -1.00000 | 11001 | 6 | .00000 | | EM21039 |
| 2308- | 1 | 114 | 11002 | 6 | 0.58778 | 11003 | 6 | 0.95105 | | EM21040 |
| 2309- | 1 | 115 | 11002 | 1 | -1.00000 | 11001 | 1 | 1.00000 | | EM21041 |
| 2310- | 1 | 115 | 11002 | 1 | 0.58778 | 11003 | 1 | 1.00000 | | EM21042 |
| 2311- | 1 | 115 | 11002 | 2 | -1.00000 | 11001 | 2 | .00000 | | EM21043 |
| 2312- | 1 | 115 | 11002 | 2 | 0.80901 | 11003 | 2 | 0.95105 | | EM21044 |
| 2313- | 1 | 115 | 11002 | 3 | -1.00000 | 11001 | 3 | 1.00000 | | EM21045 |
| 2314- | 1 | 115 | 11002 | 3 | 0.58778 | 11003 | 3 | 0.36901 | | EM21046 |
| 2315- | 1 | 115 | 11002 | 4 | -1.00000 | 11001 | 4 | .00000 | | EM21047 |
| 2316- | 1 | 115 | 11002 | 4 | 0.80901 | 11003 | 4 | 0.95105 | | EM21048 |
| 2317- | 1 | 115 | 11002 | 5 | -1.00000 | 11001 | 5 | 1.00000 | | EM21049 |
| 2318- | 1 | 115 | 11002 | 5 | 0.58778 | 11003 | 5 | 0.36901 | | EM21050 |
| 2319- | 1 | 115 | 11002 | 6 | -1.00000 | 11001 | 6 | .00000 | | EM21051 |
| 2320- | 1 | 115 | 11002 | 6 | 0.80901 | 11003 | 6 | 0.95105 | | EM21052 |
| 2321- | 1 | 116 | 11002 | 1 | -1.00000 | 11001 | 1 | 1.00000 | | EM21053 |
| 2322- | 1 | 116 | 11002 | 1 | 0.36901 | 11003 | 1 | 0.00000 | | EM21054 |
| 2323- | 1 | 116 | 11002 | 2 | -1.00000 | 11001 | 2 | .00000 | | EM21055 |
| 2324- | 1 | 116 | 11002 | 2 | 0.95105 | 11003 | 2 | 0.58778 | | EM21056 |
| 2325- | 1 | 116 | 11002 | 3 | -1.00000 | 11001 | 3 | 1.00000 | | EM21057 |
| 2326- | 1 | 116 | 11002 | 3 | 0.36901 | 11003 | 3 | 0.00000 | | EM21058 |
| 2327- | 1 | 116 | 11002 | 4 | -1.00000 | 11001 | 4 | .00000 | | EM21059 |
| 2328- | 1 | 116 | 11002 | 4 | 0.95105 | 11003 | 4 | 0.58778 | | EM21060 |
| 2329- | 1 | 116 | 11002 | 5 | -1.00000 | 11001 | 5 | 1.00000 | | EM21061 |
| 2330- | 1 | 116 | 11002 | 5 | 0.36901 | 11003 | 5 | 0.00000 | | EM21062 |
| 2331- | 1 | 116 | 11002 | 6 | -1.00000 | 11001 | 6 | .00000 | | EM21063 |
| 2332- | 1 | 116 | 11002 | 6 | 0.95105 | 11003 | 6 | 0.58778 | | EM21064 |
| 2333- | 1 | 117 | 11002 | 1 | -1.00000 | 11001 | 1 | 1.00000 | | EM21065 |
| 2334- | 1 | 117 | 11002 | 1 | 0.00000 | 11003 | 1 | 1.00000 | | EM21066 |
| 2335- | 1 | 117 | 11002 | 2 | -1.00000 | 11001 | 2 | .00000 | | EM21067 |
| 2336- | 1 | 117 | 11002 | 2 | 0.00000 | 11003 | 2 | 0.00000 | | EM21068 |
| 2337- | 1 | 117 | 11002 | 3 | -1.00000 | 11001 | 3 | 1.00000 | | EM21069 |
| 2338- | 1 | 117 | 11002 | 3 | 0.00000 | 11003 | 3 | 1.00000 | | EM21070 |
| 2339- | 1 | 117 | 11002 | 4 | -1.00000 | 11001 | 4 | .00000 | | EM21071 |
| 2340- | 1 | 117 | 11002 | 4 | 1.00000 | 11003 | 4 | 0.00000 | | EM21072 |
| 2341- | 1 | 117 | 11002 | 5 | -1.00000 | 11001 | 5 | 1.00000 | | EM21073 |
| 2342- | 1 | 117 | 11002 | 5 | 0.00000 | 11003 | 5 | 1.00000 | | EM21074 |
| 2343- | 1 | 117 | 11002 | 6 | -1.00000 | 11001 | 6 | .00000 | | EM21075 |
| 2344- | 1 | 117 | 11002 | 6 | 1.00000 | 11003 | 6 | 0.00000 | | EM21076 |
| 2345- | 1 | 118 | 11002 | 1 | -1.00000 | 11001 | 1 | 1.00000 | | EM21077 |
| 2346- | 1 | 118 | 11002 | 1 | 0.00000 | 11003 | 1 | 1.00000 | | EM21078 |
| 2347- | 1 | 118 | 11002 | 2 | -1.00000 | 11001 | 2 | .00000 | | EM21079 |
| 2348- | 1 | 118 | 11002 | 2 | 0.95105 | 11003 | 2 | 0.58778 | | EM21080 |
| 2349- | 1 | 118 | 11002 | 3 | -1.00000 | 11001 | 3 | 1.00000 | | EM21081 |
| 2350- | 1 | 118 | 11002 | 3 | 0.00000 | 11003 | 3 | 0.00000 | | EM21082 |

SORTED BULK DATA ECHD

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---|-----|-------|---------------|-------|-----------|---|---|---|---------|
| 2351- | 1 | 118 | 4 | -1.0000011001 | 4 | .00000 | | | | CM21074 |
| 2352- | 1 | 118 | 11002 | 4 0.95105 | 11003 | 4-0.58778 | | | | CM21075 |
| 2353- | 1 | 118 | 11002 | -1.0000011001 | 5 | 1.00000 | | | | CM21076 |
| 2354- | 1 | 118 | 11002 | 5-0.30901 | 11003 | 5-0.80901 | | | | CM21077 |
| 2355- | 1 | 118 | 11002 | -1.0000011001 | 6 | .00000 | | | | CM21078 |
| 2356- | 1 | 119 | 11002 | 6 0.95105 | 11003 | 6-0.58778 | | | | CM21079 |
| 2357- | 1 | 119 | 11002 | -1.0000011001 | 1 | 1.00000 | | | | CM21080 |
| 2358- | 1 | 119 | 11002 | 1-0.58778 | 11003 | 1-0.30901 | | | | CM21081 |
| 2359- | 1 | 119 | 11002 | -1.0000011001 | 2 | .00000 | | | | CM21082 |
| 2360- | 1 | 119 | 11002 | 2 0.80901 | 11003 | 2-0.95105 | | | | CM21083 |
| 2361- | 1 | 119 | 11002 | -1.0000011001 | 3 | 1.00000 | | | | CM21084 |
| 2362- | 1 | 119 | 11002 | 3-0.58778 | 11003 | 3-0.30901 | | | | CM21085 |
| 2363- | 1 | 119 | 11002 | -1.0000011001 | 4 | .00000 | | | | CM21086 |
| 2364- | 1 | 119 | 11002 | 4 0.80901 | 11003 | 4-0.95105 | | | | CM21087 |
| 2365- | 1 | 119 | 11002 | -1.0000011001 | 5 | 1.00000 | | | | CM21088 |
| 2366- | 1 | 119 | 11002 | 5-0.58778 | 11003 | 5-0.30901 | | | | CM21089 |
| 2367- | 1 | 119 | 11002 | -1.0000011001 | 6 | .00000 | | | | CM21090 |
| 2368- | 1 | 120 | 11002 | 6 0.80901 | 11003 | 6-0.95105 | | | | CM21091 |
| 2369- | 1 | 120 | 11002 | -1.0000011001 | 1 | 1.00000 | | | | CM21092 |
| 2370- | 1 | 120 | 11002 | 1-0.80901 | 11003 | 1 0.30901 | | | | CM21093 |
| 2371- | 1 | 120 | 11002 | -1.0000011001 | 2 | .00000 | | | | CM21094 |
| 2372- | 1 | 120 | 11002 | 2 0.58778 | 11003 | 2-0.95105 | | | | CM21095 |
| 2373- | 1 | 120 | 11002 | -1.0000011001 | 3 | 1.00000 | | | | CM21096 |
| 2374- | 1 | 120 | 11002 | 3-0.80901 | 11003 | 3 0.30901 | | | | CM21097 |
| 2375- | 1 | 120 | 11002 | -1.0000011001 | 4 | .00000 | | | | CM21098 |
| 2376- | 1 | 120 | 11002 | 4 0.58778 | 11003 | 4-0.95105 | | | | CM21099 |
| 2377- | 1 | 120 | 11002 | -1.0000011001 | 5 | 1.00000 | | | | CM21100 |
| 2378- | 1 | 120 | 11002 | 5-0.80901 | 11003 | 5 0.30901 | | | | CM21101 |
| 2379- | 1 | 120 | 11002 | -1.0000011001 | 6 | .00000 | | | | CM21102 |
| 2380- | 1 | 121 | 11002 | 6 0.58778 | 11003 | 6-0.95105 | | | | CM21103 |
| 2381- | 1 | 121 | 11002 | -1.0000011001 | 1 | 1.00000 | | | | CM21104 |
| 2382- | 1 | 121 | 11002 | 1-0.95105 | 11003 | 1 0.80901 | | | | CM21105 |
| 2383- | 1 | 121 | 11002 | -1.0000011001 | 2 | .00000 | | | | CM21106 |
| 2384- | 1 | 121 | 11002 | 2 0.30901 | 11003 | 2-0.58778 | | | | CM21107 |
| 2385- | 1 | 121 | 11002 | -1.0000011001 | 3 | 1.00000 | | | | CM21108 |
| 2386- | 1 | 121 | 11002 | 3-0.80901 | 11003 | 3 0.80901 | | | | CM21109 |
| 2387- | 1 | 121 | 11002 | -1.0000011001 | 4 | .00000 | | | | CM21110 |
| 2388- | 1 | 121 | 11002 | 4 0.30901 | 11003 | 4-0.58778 | | | | CM21111 |
| 2389- | 1 | 121 | 11002 | -1.0000011001 | 5 | 1.00000 | | | | CM21112 |
| 2390- | 1 | 121 | 11002 | 5-0.95105 | 11003 | 5 0.80901 | | | | CM21113 |
| 2391- | 1 | 121 | 11002 | -1.0000011001 | 6 | .00000 | | | | CM21114 |
| 2392- | 1 | 122 | 11002 | 6 0.30901 | 11003 | 6-0.58778 | | | | CM21115 |
| 2393- | 1 | 122 | 11002 | -1.0000011001 | 1 | 1.00000 | | | | CM21116 |
| 2394- | 1 | 122 | 11002 | 1-0.00000 | 11003 | 1 1.00000 | | | | CM21117 |
| 2395- | 1 | 122 | 11002 | -1.0000011001 | 2 | .00000 | | | | CM21118 |
| 2396- | 1 | 122 | 11002 | 2 0.00000 | 11003 | 2-0.00000 | | | | CM21119 |
| 2397- | 1 | 122 | 11002 | -1.0000011001 | 3 | 1.00000 | | | | CM21120 |
| 2398- | 1 | 122 | 11002 | 3-1.00000 | 11003 | 3 1.00000 | | | | CM21121 |
| 2399- | 1 | 122 | 11002 | -1.0000011001 | 4 | .00000 | | | | CM21122 |
| 2400- | 1 | 122 | 11002 | 4 0.00000 | 11003 | 4-0.00000 | | | | CM21123 |

APRIL 11. 1974 NASTRAN 5/13/72

AXISYMMETRIC CIRC. CYL. WITH FLUID
HARMONIC REDUCTION

SORTED BULK DATA ECHO

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---------|-------|-------|-------|-----------|---------|-------|-----------|------|---------|
| COUNT | 1 | 122 | 11002 | 5 | 11002 | 11003 | 5 | 1.00000 | 5 | 10 |
| 2401- | MPG | | | | | | | | | |
| 2402- | CM21115 | | | | | | | | | CM21115 |
| 2403- | MPG | 1 | 122 | 6 | 5-1.00000 | 11003 | 5 | 1.00000 | | |
| 2404- | CM21116 | | | | | | | | | CM21116 |
| 2405- | DMIT1 | 26 | 11002 | 11003 | 6 | 0.00000 | 11003 | 6-0.00000 | | |
| 2406- | DMIT1 | 35 | 1001 | | | | | | | |
| 2407- | DMIT1 | 35 | 2001 | 3001 | 4001 | 5001 | 6001 | 7001 | 8001 | |
| 2408- | DMIT1 | 35 | 9001 | 10001 | | | | | | |
| 2409- | DMIT1 | 345 | 1002 | 1003 | | | | | | |
| 2410- | DMIT1 | 23456 | 2002 | 2003 | 3002 | 3003 | 4002 | 4003 | | |
| 2411- | DMIT1 | 23456 | 5002 | 5003 | 6002 | 6003 | 7002 | 7003 | | |
| 2412- | DMIT1 | 23456 | 8002 | 8003 | 9002 | 9003 | 10002 | 10003 | | |
| 2413- | PQUAD2 | 1 | 1 | .01 | .0 | | | | | |
| 2414- | SPC1 | 1 | 1 | 1001 | | | | | | |
| 2415- | SPC1 | 1 | 35 | 11001 | | | | | | |
| 2416- | SPC1 | 1 | 126 | 1002 | 1003 | | | | | |
| 2417- | SPC1 | 1 | 246 | 1001 | 2001 | 3001 | 4001 | 5001 | 6001 | |
| 2418- | SPC1 | 1 | 246 | 7001 | 8001 | 9001 | 10001 | 11001 | | |
| 2419- | SPC1 | 1 | 345 | 11002 | 11003 | | | | | |
| | ENDATA | | | | | | | | | |

V A S T R A N S O U R C E P R O G R A M C C M P I L A T I O N
D4AP-DMAP INSTRUCTION
NO.

```

1 BEGIN NO.3 NORMAL MODES ANALYSIS - SERIES M $
2 FILE LLL=TAPE $
3 GP1 GEOM1,GEOM2,/GPI,EOEXIN,GPDY,CSTP,BGPDY,SIL/V,N,LUSET/ C,N,
    123/V,N,NOGPDY $
4 SAVE LUSET $
5 CHKPNY GPL,EOEXIN,GPDY,CSTM,BGPDY,SIL $
6 GP2 GEOM2,EOEXIN/ECT $
7 CHKPNY ECT $
8 PLTSET PCDB,EOEXIN,ECT/PLTSETX,PLTPAR,GPSETS,ELSETS/V,N,NSIL/ V,N,
    JUMPPLOT $
9 SAVE NSIL,JUMPPLOT $
10 PRMSG PLTSETX// $
11 SILVAL //V,N,PLTFLG/C,N,1/V,N,PFILE/C,N,0 $
12 SAVE PLTFLG,PFILE $
13 COND P1,JUMPPLOT $
14 PLJ1 PLTPAR,GPSETS,ELSETS,CASECC,BGPDY,EOEXIN,SIL,/PLOTX1/ V,N,
    P,SIL/V,N,LUSET/V,N,JUMPPLOT/V,N,PLTFLG/V,N,PFILE $
15 SAVE JUMPPLOT,PLTFLG,PFILE $
16 PRMSG PLOTX1// $
17 LAJEL P1 $
18 CHKPNY PLTPAR,GPSETS,ELSETS $
19 GP3 GEOM3,EOEXIN,GEOM2,/GPTT/C,N,123/V,N,NOGRAV/C,N,123 $
20 CHKPNY GPTT $
21 TAI, ECT,ECT,BGPDY,SIL,GPTT,CSTM/ECT,GEI,ECT,GPCT/V,N,LUSET/ C,N,
    123/V,N,NOIMP/C,N,0/V,N,NOGENL/V,N,GENEL $
22 SAVE NOGENL,NOIMP,GEREL $

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APRIL 11, 1974 NASTRAN 9/13/72

AKISYNMETRIC CIRC. CYL. WITH FLUID

HARMONIC REDUCTION

NASTRAN SOURCE PROGRAM COMPILATION

DMAP-DMAP INSTRUCTION

NO.

23 COND ERROR1,NOSIMP \$

24 PURGE DGPST/GENEL \$

25 CHKPNT EST,ECPT,GPCT,GEI,OGPST \$

26 SMA1 CSTM,MPT,ECPT,GPCT,DIT/KGGX,GPST/V,N,NOGENL/V,N,NOKIGG \$

27 CHKPNT KGGX,GPST \$

28 SMA2 CSTM,MPT,ECPT,GPCT,DIT/WGG,V,Y,WTMASS=1.0/V,N,NOMGG/V,N,NOMGG/
V,Y,CQUPMASS/V,Y,CPBAR/V,Y,CPRD/V,Y,CPUAD1/V,Y,CPUAD2/V,
Y,CPTRIAL/V,Y,CPTRIAL2/V,Y,CPTUBE/V,Y,CPCDPLT/V,Y,CPTRPLT/V,Y,
CPTBSC \$

29 SAVE NDMGG \$

30 COND ERROR1,NOMGG \$

31 CHKPNT MGG \$

32 COND LGPWG,GRDPT \$

33 GFWG BCDPT,CSTM,EQEXIN,MGG/OGPWG/V,Y,GRDPT=-1/V,Y,WTMASS \$

34 DFP OGPWG,...../V,N,CARDNO \$

35 SAVE CARDNO \$

36 LAJFL LGPWG \$

37 EQUJIV KGGX,KGG/NOGENL \$

38 CHKPNT KGG \$

39 COND LBL11,NOGENL \$

40 SMA3 GEI,KGGX/KGG/V,N,LUSET/V,N,NOGENL/V,N,NOSIMP \$

41 CHKPNT KGG \$

42 LABEL LBL11 \$

43 PARAM //C,N,MPY/V,N,NSKIP/C,N,0/C,N,0 \$

44 GPA CASECC,GEOWA,EQEXIN,SIL,GPDT/RG,USESET/V,N,LUSET/V,N,MPCF1/V,
N,MPCF2/V,N,SINGLE/V,N,OMIT/V,N,REACT/V,N,NSKIP/V,N,REPEAT/
V,N,NOSIMP1/V,N,NCL/V,N,NOA \$

45 SAVE WPCF1,MPCF2,SINGLE,OMIT,REACT,NSKIP,REPEAT,NOSIMP,NCL,NOA \$

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APRIL 11, 1974 NASTRAN 6/13/72

AXISYMMETRIC CIRC. CYL. WITH FLUID

HARMONIC REDUCTION

NASTRAN SOURCE PROGRAM COMPILATION

DMAP-DMAP INSTRUCTION

NO.

46 COND ERROR3,NCL \$

47 PURGE KRR,KLR,DM,MLR,WR/REACT/GM/MPCFI/GO/OMIT/KFS/S INGLE/OG/NOSET \$

48 EQUIV KGG,KNN/MPCFI/MGG,MNN/MPCFI \$

49 CHKPNT KRR,KLR,DM,PLR,WR,GM,RG,GO,KFS,CG,USET,KNN,MNN \$

50 COND LBL4,GENEL \$

51 GPSP GPL,GPST,LSET,SIL/OGPST \$

52 OFP OGPST...../V,N,CARDNO \$

53 SAVE CARDNO \$

54 LAJEL LBL4 \$

55 COND LBL2,MPCF2 \$

56 MCE1 USET,RG/GM \$

57 CHKPNT GM \$

58 MCE2 USET,GM,MGG,MGG.../KNN,MNN... \$

59 CHKPNT KNN,MNN \$

60 LAJEL LBL2 \$

61 EQUIV KNN,KFF/SINGLE/MNN,MFF/SINGLE \$

62 CHKPNT KFF,MFF \$

63 COND LBL3,SINGLE \$

64 SCE1 USET,KNN,MNN.../KFF,KFS,MFF... \$

65 CHKPNT KFS,KFF,MFF \$

66 LAJEL LBL3 \$

67 EQUIV KFF,KAA/OMIT/MFF,MAA/OMIT \$

68 CHKPNT KAA,MAA \$

69 CUYD LBL5,OMIT \$

70 SMJ1 USET,KFF.../GO,KAA,KOO,LOG,UOO,.... \$

5/13/72

APRIL 11, 1974

AXISymmetric CIRC. CYL. WITH FLUID

HARMONIC REDUCTION

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

DNAP-DNAP INSTRUCTION

NU.

71 CHKPNT GO,KAA \$

72 SM2 USET,GO,OFF/MAA \$

73 CHKPNT MAA \$

74 LABEL LBL5 \$

74 ADD MAA,MFLD/MAH \$

74 PARAM //G,N,NOP/V,N.TRUE=-1 \$

74 EQUIV MAH,MAA/TRUE \$

74 COND MAHNO9,TRUE \$

74 MATPRN MAH,.,.,.,.// \$

74 LABEL MAHNO9 \$

75 COND LBL6,REACT \$

76 H84G1 USET,KAA,MAA/KLL,KLR,KRR,MLL,MLR,MRR \$

77 CHKPNT KLL,KLR,KRR,MLL,MLR,MRR \$

78 H84G2 KLL/LLL,ULL \$

79 CHKPNT ULL,ULL \$

80 H84G3 LLL,ULL,KLR,KRR/DM \$

81 CHKPNT DM \$

82 H84G4 DM,MLL,MLR,MRR/MR \$

83 CHKPNT MR \$

84 LABEL LBL6 \$

85 DPJ DYNAMICS,GPL,SIL,USET/GPLD,SILD,USETD,.,.,.,.,EED,EODYN/V,N,
-USET/V,N,LLSETD/V,N,NOTFL/V,N,ACOLT/V,N,NOPSDL/V,N,NDFRL/ V,
N,NJNFLT/V,N,NOTRL/V,N,NCEED/C,N,123/V,N,NOUE \$

86 SAVE NEEDED \$

87 COND ERRON2,NCEED \$

88 CHKPNT EED \$

APRIL 11, 1974 NASTRAN 5/13/72

AXISYNCT CIRC. CYL. WITH FLUID
HARMONIC REDUCTION

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

D4AP-DMAP INSTRUCTION

NO.

88 SEEMAT MCG.KGG.//C.N.PRINT

89 READ KAA.MAA.MR.DM.EED.USET.CASECC/LANA.PHIA.WI.OEIGS/C.N.MODES/V.N.
NEIGV \$

90 SAVE NEIGV \$

91 CHKPNT LANA.PHIA.WI.OEIGS \$

91 MATGPR GPL.USET.SIL.PHIA/C.N.A

92 UP3 LANA.OEIGS.//V.N.CARDNO \$

93 SAVE CARDNO \$

94 COND FINIS.NEIGV \$

95 SDR1 USET.PHIA.GG.GH.MFS.//PHIG.OG/C.N.I/C.N.REIG \$

96 CHKPNT PHIG.OG \$

97 PARAM //C.N.SUB/V.N.SCALAR/V.N.SIL/V.N.LUSEP \$

98 ECJIV SIL.SIP/SCALAR/BGPDY.BGPDY/SCALAR \$

99 CHKPNT SIP.BGPDY \$

100 CG4D LBL7.SCALAR \$

101 PLITRAN BGPDY.SIL/BGPDY.SIP/V.N.LUSEP/V.N.LUSEP \$

102 SAVE LUSEP \$

103 CHKPNT BGPDY.SIP \$

104 LABEL LBL7 \$

105 SD42 CASECC.CSTM.MPT.DIT.EDEXIN.SIL.//BGPDY.LANA.OG.PHIG.EST.//.00G1.
OPHIG.OESI.DEF1.PPHIG/C.N.REIG \$

106 QPP OPHIG.00G1.DEF1.OESI.//V.N.CARDNO \$

107 SAVE CARDNO \$

107 SMPYAD PHIA.KAA.PHIA.//KH/C.N.3/C.N.1/C.N.1/C.N.2/C.N.1 \$

107 SOLVE MI.KH/WH/C.N.1 \$

107 SMPYAD PDU2.PHIA.WH.//PD2/C.N.3 \$

AXISYMMETRIC CIRC. CYL. WITH FLUID
HARMONIC REDUCTION
APRIL 11, 1974 NASTRAN 5/13/72

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

DMAP-DMAP INSTRUCTION

NJ.

107 MPYAD TU12,PHIA.,/PHF/C.N.0 \$

107 MATPRN WH,PD2,PHF.,// \$

108 COND P2,JUMPPLOT \$

109 PLJOT PLTPAR,GPSETS,ELSETS,CASECC,BGPDY,ECXIN,SIP.,PPHIG / PLOTX2/
V.N,NSIL/V,N,LUSET/V,N,JUMPPLOT/V,N,PLTFLG/V,N,PPFILE \$

110 SAVE PFILE \$

111 PRTMSG PLOTX2// \$

112 LABEL P2 \$

113 JUMP FINIS \$

114 LABEL ERROR1 \$

115 PRTPARM //C.N.-1/C.N.MODES \$

116 LABEL ERROR2 \$

117 PRTPARM //C.N.-2/C.N.MODES \$

118 LABEL ERROR3 \$

119 PRTPARM //C.N.-3/C.N.MODES \$

120 LABEL FINIS \$

121 END \$

NU ERRORS FOUND - EXECUTE NASTRAN PROGRAM

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MAY 4, 1974 NASTRAN 5/13/72

NASTRAN EXECUTIVE CONTROL DECK ECHO

IO,CAP00,COPPOLING

APP DISP

SUL 13.0

TIME JO

DIAG 2

DIAG 7.8,13,14,19,21,22

ALTER 125

ADD MAA,MFLD/MAH 2

PARAM //C.N.NGP/V.N.TRUE=-1 \$

LOGIV MAH,MAA/TRUE \$

CUND MAHNO9.TRUE \$

MATPRN MAH...// \$

LABEL MAHNO9 \$

ALTER 129

SEEMAT MGG,KHGG...//C.N.PRINT \$

ALTER 140

SMPLYAD PHIA,KDAA,PHIA.../KH/C.N.3/C.N.1/C.N.2/C.N.1 \$

SMPLYAD PHIA,MAA,PHIA.../W/C.N.3/C.N.1/C.N.1/C.N.2/C.N.1 \$

SOLVE M,KH/WH/C.N.1 \$

SMPLYAD PLU2,PHIA,PH.../PE2/C.N.3 \$

SMPLYAD TUI2,PHIA,PH.../PHF/C.N.0 \$

MATPRN M,P02,PHF...// \$

ENDALTER

CLND

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AXISYMMETRIC CIRC. CYL. WITH FLUID
HARMONIC REDUCTION

MAY 4. 1974 NASTRAN 5/13/72

CASE CONTROL DECK ECHO

CARD
COUNT

1 TITLE=AXISYMMETRIC CIRC. CYL. WITH FLUID
2 SUBTITLE=HARMONIC REDUCTION
3 MAXLINES=120000
4 SPC=1
5 WFC=1
6 DISP=ALL
7 SUECASE 10
8 LABEL=STATIC ANALYSIS
9 LOAD=1
10 SUECASE 20
11 LABEL=NORMAL MODE ANALYSIS
12 METHOD=1
13 BEGIN BULK

*** USER INFORMATION MESSAGE 207. BULK DATA NOT SORTED.XSORT WILL RE-ORDER DECK.

SORTED BULK DATA ECHO

| CARD
COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------------|----|---|----|----|----|----|----|----|----|----|
| 1- CORD2C | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2- SCGC | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3- CQUAC2 | 2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 4- CQUAD2 | 3 | 1 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 5- CQUAD2 | 4 | 1 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 6- CQUAD2 | 5 | 1 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 7- CQUAC2 | 6 | 1 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| 8- CQUAC2 | 7 | 1 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 9- CQUAD2 | 8 | 1 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 10- CQUAD2 | 9 | 1 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 11- CQUAC2 | 10 | 1 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 12- CQUAD2 | 11 | 1 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 13- CQUAD2 | 12 | 1 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 14- CQUAD2 | 13 | 1 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 15- CQUAD2 | 14 | 1 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 16- CQUAD2 | 15 | 1 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| 17- CQUAD2 | 16 | 1 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| 18- CQUAD2 | 17 | 1 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 19- CQUAD2 | 18 | 1 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 20- CQUAD2 | 19 | 1 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| 21- CQUAD2 | 20 | 1 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| 22- CQUAD2 | 21 | 1 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 23- CQUAD2 | 22 | 1 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 |
| 24- CQUAD2 | 23 | 1 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 25- CQUAD2 | 24 | 1 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
| 26- CQUAD2 | 25 | 1 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 |
| 27- CQUAD2 | 26 | 1 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 |
| 28- CQUAD2 | 27 | 1 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 |
| 29- CQUAD2 | 28 | 1 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 |
| 30- CQUAD2 | 29 | 1 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 |
| 31- CQUAD2 | 30 | 1 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 |
| 32- CQUAD2 | 31 | 1 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 |
| 33- CQUAD2 | 32 | 1 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 |
| 34- CQUAD2 | 33 | 1 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 35- CQUAD2 | 34 | 1 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 |
| 36- CQUAD2 | 35 | 1 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 |
| 37- CQUAD2 | 36 | 1 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 |
| 38- CQUAD2 | 37 | 1 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 |
| 39- CQUAD2 | 38 | 1 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 |
| 40- CQUAD2 | 39 | 1 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 |
| 41- CQUAD2 | 40 | 1 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 |
| 42- CQUAD2 | 41 | 1 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 |
| 43- CQUAD2 | 42 | 1 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 |
| 44- CQUAD2 | 43 | 1 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 45- CQUAD2 | 44 | 1 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 |
| 46- CQUAD2 | 45 | 1 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 |
| 47- CQUAD2 | 46 | 1 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 |
| 48- CQUAD2 | 47 | 1 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 |
| 49- CQUAD2 | 48 | 1 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 |
| 50- CQUAD2 | 49 | 1 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 |
| 51- CQUAD2 | 50 | 1 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 |
| 52- CQUAD2 | 51 | 1 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 |
| 53- CQUAD2 | 52 | 1 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 |
| 54- CQUAD2 | 53 | 1 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 55- CQUAD2 | 54 | 1 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 |
| 56- CQUAD2 | 55 | 1 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 |
| 57- CQUAD2 | 56 | 1 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 |
| 58- CQUAD2 | 57 | 1 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 |
| 59- CQUAD2 | 58 | 1 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 |
| 60- CQUAD2 | 59 | 1 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 |

SORTED BULK DATA ECHO

| CARD
COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------------|------------|---|-----|-----|-----|-----|---|--------|---|----|
| 51- | CUUAD2 54 | 1 | 54 | 55 | 66 | 65 | | .00000 | | |
| 52- | CUUAD2 55 | 1 | 55 | 56 | 67 | 66 | | .00000 | | |
| 53- | CUUAD2 57 | 1 | 57 | 58 | 69 | 68 | | .00000 | | |
| 54- | CUUAD2 58 | 1 | 58 | 59 | 70 | 69 | | .00000 | | |
| 55- | CUUAC2 59 | 1 | 59 | 60 | 71 | 70 | | .00000 | | |
| 56- | CUUAD2 60 | 1 | 60 | 61 | 72 | 71 | | .00000 | | |
| 57- | CUUAD2 61 | 1 | 61 | 62 | 73 | 72 | | .00000 | | |
| 58- | CUUAD2 62 | 1 | 62 | 63 | 74 | 73 | | .00000 | | |
| 59- | CUUAD2 63 | 1 | 63 | 64 | 75 | 74 | | .00000 | | |
| 60- | CUUAC2 64 | 1 | 64 | 65 | 76 | 75 | | .00000 | | |
| 61- | CUUAC2 65 | 1 | 65 | 66 | 77 | 76 | | .00000 | | |
| 62- | CUUAC2 66 | 1 | 66 | 67 | 78 | 77 | | .00000 | | |
| 63- | CUUAD2 68 | 1 | 68 | 69 | 80 | 79 | | .00000 | | |
| 64- | CUUAD2 69 | 1 | 69 | 70 | 81 | 80 | | .00000 | | |
| 65- | CUUAC2 70 | 1 | 70 | 71 | 82 | 81 | | .00000 | | |
| 66- | CUUAD2 71 | 1 | 71 | 72 | 83 | 82 | | .00000 | | |
| 67- | CUUAC2 72 | 1 | 72 | 73 | 84 | 83 | | .00000 | | |
| 68- | CUUAD2 73 | 1 | 73 | 74 | 85 | 84 | | .00000 | | |
| 69- | CUUAC2 74 | 1 | 74 | 75 | 86 | 85 | | .00000 | | |
| 70- | CUUAD2 75 | 1 | 75 | 76 | 87 | 86 | | .00000 | | |
| 71- | CUUAD2 76 | 1 | 76 | 77 | 88 | 87 | | .00000 | | |
| 72- | CUUAC2 77 | 1 | 77 | 78 | 89 | 88 | | .00000 | | |
| 73- | CUUAD2 79 | 1 | 79 | 80 | 91 | 90 | | .00000 | | |
| 74- | CUUAC2 80 | 1 | 80 | 81 | 92 | 91 | | .00000 | | |
| 75- | CUUAC2 81 | 1 | 81 | 82 | 93 | 92 | | .00000 | | |
| 76- | CUUAD2 82 | 1 | 82 | 83 | 94 | 93 | | .00000 | | |
| 77- | CUUAD2 83 | 1 | 83 | 84 | 95 | 94 | | .00000 | | |
| 78- | CUUAD2 84 | 1 | 84 | 85 | 96 | 95 | | .00000 | | |
| 79- | CUUAD2 85 | 1 | 85 | 86 | 97 | 96 | | .00000 | | |
| 80- | CUUAC2 86 | 1 | 86 | 87 | 98 | 97 | | .00000 | | |
| 81- | CUUAC2 87 | 1 | 87 | 88 | 99 | 98 | | .00000 | | |
| 82- | CUUAD2 88 | 1 | 88 | 89 | 100 | 99 | | .00000 | | |
| 83- | CUUAD2 90 | 1 | 90 | 91 | 102 | 101 | | .00000 | | |
| 84- | CUUAD2 91 | 1 | 91 | 92 | 103 | 102 | | .00000 | | |
| 85- | CUUAD2 92 | 1 | 92 | 93 | 104 | 103 | | .00000 | | |
| 86- | CUUAC2 93 | 1 | 93 | 94 | 105 | 104 | | .00000 | | |
| 87- | CUUAC2 94 | 1 | 94 | 95 | 106 | 105 | | .00000 | | |
| 88- | CUUAC2 95 | 1 | 95 | 96 | 107 | 106 | | .00000 | | |
| 89- | CUUAD2 96 | 1 | 96 | 97 | 108 | 107 | | .00000 | | |
| 90- | CUUAD2 97 | 1 | 97 | 98 | 109 | 108 | | .00000 | | |
| 91- | CUUAD2 98 | 1 | 98 | 99 | 110 | 109 | | .00000 | | |
| 92- | CUUAD2 99 | 1 | 99 | 100 | 111 | 110 | | .00000 | | |
| 93- | CUUAD2 101 | 1 | 101 | 102 | 113 | 112 | | .00000 | | |
| 94- | CUUAD2 102 | 1 | 102 | 103 | 114 | 113 | | .00000 | | |
| 95- | CUUAC2 103 | 1 | 103 | 104 | 115 | 114 | | .00000 | | |
| 96- | CUUAD2 104 | 1 | 104 | 105 | 116 | 115 | | .00000 | | |
| 97- | CUUAC2 105 | 1 | 105 | 106 | 117 | 116 | | .00000 | | |
| 98- | CUUAD2 106 | 1 | 106 | 107 | 118 | 117 | | .00000 | | |
| 99- | CUUAD2 107 | 1 | 107 | 108 | 119 | 118 | | .00000 | | |
| 100- | CUUAD2 108 | 1 | 108 | 109 | 120 | 119 | | .00000 | | |

CARD
COUNT

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|--------------------|----|-----------------|-----------------|-----------------|-----------------|-----------------|--------|--------|--------|
| 101-
CQUAD2 109 | 1 | 109 | 110 | 111 | 121 | 120 | 0.0000 | 0.0000 | 0.0000 |
| 102-
CQUAD2 110 | 1 | 110 | 111 | 121 | 122 | 121 | 0.0000 | 0.0000 | 0.0000 |
| 103-
DMI | 0 | 1 | 1 | 1 | 2 | 30 | 30 | 30 | 30 |
| 104-
DMI | 0 | 1 | 1 | 1 | 2 | 30 | 30 | 30 | 30 |
| 105-
*AMF | 1 | 1.03753539E-09 | 1.74902981E-09 | 3.54101434E-02 | 5.17619758E-09 | 9.21048224E-03 | *AMF | 1 | 2 |
| 106-
*AMF | 2 | 3.99240818E-09 | 2.90458575E-02 | -2.14204410E-09 | 4.51854376E-09 | 4.51854376E-09 | *AMF | 3 | 4 |
| 107-
*AMF | 3 | 2.67748457E-02 | -2.62338569E-09 | 4.61171368E-09 | 2.58644857E-02 | 2.58644857E-02 | *AMF | 5 | 6 |
| 108-
*AMF | 4 | -2.88329072E-09 | 4.60391210E-09 | 2.54706964E-02 | -3.02422776E-09 | -3.02422776E-09 | *AMF | 7 | 8 |
| 109-
*AMF | 5 | 4.58462904E-09 | 2.52929702E-02 | -3.10135118E-09 | 4.57119853E-09 | 4.57119853E-09 | *AMF | 9 | 10 |
| 110-
*AMF | 6 | 2.52110781E-02 | -3.14255604E-09 | 4.56220661E-09 | 2.51789051E-02 | 2.51789051E-02 | *AMF | 11 | 12 |
| 111-
*AMF | 7 | -3.16256843E-09 | 4.55771954E-09 | 1.25835799E-02 | -2.14254015E-09 | -2.14254015E-09 | *AMF | 13 | 14 |
| 112-
*AMF | 8 | 2.37040805E-09 | 1.03753539E-09 | 9.21048224E-03 | *AMF | 1 | 2 | 30 | 30 |
| 113-
DMI | 0 | 1 | 1 | 1 | 2 | 30 | 30 | 30 | 30 |
| 114-
*AMF | 10 | 2.26114988E-02 | 7.61923413E-10 | -1.17619758E-09 | 9.21048224E-03 | 9.21048224E-03 | *AMF | 11 | 12 |
| 115-
*AMF | 11 | -1.17605836E-09 | -2.14204410E-09 | 4.30269912E-03 | -1.12416187E-09 | -1.12416187E-09 | *AMF | 13 | 14 |
| 116-
*AMF | 12 | -2.62530856E-09 | 2.16825819E-03 | -7.63552999E-10 | -2.88329072E-09 | -2.88329072E-09 | *AMF | 15 | 16 |
| 117-
*AMF | 13 | 1.13540688E-03 | -4.76362380E-10 | -3.02422776E-09 | 6.07478337E-04 | 6.07478337E-04 | *AMF | 17 | 18 |
| 118-
*AMF | 14 | -2.75142757E-10 | -3.10135118E-09 | 3.31870979E-04 | -1.58317554E-10 | -1.58317554E-10 | *AMF | 19 | 20 |
| 119-
*AMF | 15 | -3.14255666E-09 | 1.89498416E-04 | -9.33349370E-11 | -3.16256843E-09 | -3.16256843E-09 | *AMF | 21 | 22 |
| 120-
*AMF | 16 | 1.21905570E-04 | -6.12229934E-11 | -1.50183555E-09 | 5.10035024E-05 | 5.10035024E-05 | *AMF | 23 | 24 |
| 121-
*AMF | 17 | -2.39782222E-11 | 3 | 1 | 1.74902981E-09 | 1.74902981E-09 | *AMF | 25 | 26 |
| 122-
DMI | 0 | 1 | 1 | 1 | 2 | 30 | 30 | 30 | 30 |
| 123-
*AMF | 19 | 7.61923413E-10 | 1.83615163E-02 | 3.99240818E-09 | -1.17605836E-09 | -1.17605836E-09 | *AMF | 27 | 28 |
| 124-
*AMF | 20 | 5.28116524E-03 | 4.51854376E-09 | -1.12416187E-09 | 1.61713664E-03 | 1.61713664E-03 | *AMF | 29 | 30 |
| 125-
*AMF | 21 | 4.61171368E-09 | -7.63552999E-10 | 5.16120810E-04 | 4.60591210E-09 | 4.60591210E-09 | *AMF | 31 | 32 |
| 126-
*AMF | 22 | -4.70962380E-10 | 1.68953789E-04 | 4.58629046E-09 | -2.75142797E-10 | -2.75142797E-10 | *AMF | 33 | 34 |
| 127-
*AMF | 23 | 5.61394263E-05 | 4.57119853E-09 | -1.52317554E-10 | 1.88335543E-05 | 1.88335543E-05 | *AMF | 35 | 36 |
| 128-
*AMF | 24 | 4.56220661E-09 | -9.33349370E-11 | 6.41311362E-06 | 4.55771954E-09 | 4.55771954E-09 | *AMF | 37 | 38 |
| 129-
*AMF | 25 | -6.12229934E-11 | 2.38043708E-06 | 2.27821051E-09 | -2.58151139E-11 | -2.58151139E-11 | *AMF | 39 | 40 |
| 130-
*AMF | 26 | 7.22207631E-07 | 4 | 1 | 3.54101434E-02 | 3.54101434E-02 | *AMF | 41 | 42 |
| 131-
DMI | 0 | 1 | 1 | 1 | 2 | 30 | 30 | 30 | 30 |
| 132-
*AMF | 28 | -1.17619758E-09 | 3.99240818E-09 | 8.51596594E-02 | -1.10450804E-09 | -1.10450804E-09 | *AMF | 43 | 44 |
| 133-
*AMF | 29 | 6.26756957E-09 | 6.21849695E-02 | -3.60158127E-09 | 8.60412186E-09 | 8.60412186E-09 | *AMF | 45 | 46 |
| 134-
*AMF | 30 | 5.49103394E-02 | -5.02533126E-09 | 9.12445586E-09 | 5.22455387E-02 | 5.22455387E-02 | *AMF | 47 | 48 |
| 135-
*AMF | 31 | -5.64961056E-09 | 9.19830414E-09 | 5.11574484E-02 | -5.98463456E-09 | -5.98463456E-09 | *AMF | 49 | 50 |
| 136-
*AMF | 32 | 9.17711418E-09 | 5.06825071E-02 | -6.16678264E-09 | 9.14849707E-09 | 9.14849707E-09 | *AMF | 51 | 52 |
| 137-
*AMF | 33 | 5.04698716E-02 | -6.26391738E-09 | 9.12892162E-09 | 5.03790267E-02 | 5.03790267E-02 | *AMF | 53 | 54 |
| 138-
*AMF | 34 | -6.31106321E-09 | 9.11859033E-09 | 2.51769088E-02 | -4.27954916E-09 | -4.27954916E-09 | *AMF | 55 | 56 |
| 139-
*AMF | 35 | 4.74222261E-09 | 5 | 1 | -1.17619758E-09 | -1.17619758E-09 | *AMF | 57 | 58 |
| 140-
DMI | 0 | 1 | 1 | 1 | 2 | 30 | 30 | 30 | 30 |
| 141-
*AMF | 37 | 9.21048224E-03 | -1.17605836E-09 | -1.10450804E-09 | 2.69141980E-02 | 2.69141980E-02 | *AMF | 59 | 60 |
| 142-
*AMF | 38 | -3.62237795E-10 | -3.80158127E-09 | 1.1767390E-02 | -1.94461114E-09 | -1.94461114E-09 | *AMF | 61 | 62 |
| 143-
*AMF | 39 | -5.02533126E-09 | 5.43810800E-03 | -1.59512425E-09 | -5.64961056E-09 | -5.64961056E-09 | *AMF | 63 | 64 |
| 144-
*AMF | 40 | 2.77573429E-03 | -1.94369580E-09 | -5.98463456E-09 | 1.46727962E-03 | 1.46727962E-03 | *AMF | 65 | 66 |
| 145-
*AMF | 41 | -6.25279961E-10 | -6.16678264E-09 | 7.96974637E-04 | -3.68477653E-10 | -3.68477653E-10 | *AMF | 67 | 68 |
| 146-
*AMF | 42 | -6.26391738E-09 | 4.53770447E-04 | -2.19540483E-10 | -6.31106321E-09 | -6.31106321E-09 | *AMF | 69 | 70 |
| 147-
*AMF | 43 | 2.91505363E-04 | -1.44933050E-10 | -3.15676263E-09 | 1.21905570E-04 | 1.21905570E-04 | *AMF | 71 | 72 |
| 148-
*AMF | 44 | -5.68464682E-11 | 6 | 1 | 3.99240818E-09 | 3.99240818E-09 | *AMF | 73 | 74 |
| 149-
DMI | 0 | 1 | 1 | 1 | 2 | 30 | 30 | 30 | 30 |
| 150-
*AMF | 46 | -1.17605836E-09 | 5.28116524E-03 | 6.26756957E-09 | -1.62237795E-10 | -1.62237795E-10 | *AMF | 75 | 76 |

ORIGINAL PAGE IS
OF POOR QUALITY

S O R T E D . B U L K D A T A E C H O

| CARD | COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------|-------|----|------------------|-----------------|-----------------|-----------------|------|----|---|---|----|
| 151- | *AMF | 47 | 1.99786499E-02 | 8.60412185E-09 | -1.94461114E-09 | 5.79728559E-03 | *AMF | 48 | | | |
| 152- | *AMF | 48 | 9.12445586E-09 | -1.59512425E-09 | 1.78609033E-03 | 9.19800414E-09 | *AMF | 49 | | | |
| 153- | *AMF | 49 | -1.04369580E-09 | 5.72260236E-04 | 9.17711418E-09 | -6.29279961E-10 | *AMF | 50 | | | |
| 154- | *AMF | 50 | 1.67767344E-04 | 9.14849707E-09 | -3.68477693E-10 | 6.35525427E-05 | *AMF | 51 | | | |
| 155- | *AMF | 51 | 9.12892162E-09 | -2.19540483E-10 | 2.12144951E-05 | 9.11859033E-09 | *AMF | 52 | | | |
| 156- | *AMF | 52 | -1.44935050E-10 | 7.85752654E-06 | 4.55777993E-09 | -6.12724038E-11 | *AMF | 53 | | | |
| 157- | *AMF | 53 | 2.38093617E-06 | | | | *AMF | 54 | | | |
| 158- | OMI | | | | | | | | | | |
| 159- | *AMF | 55 | -2.14204410E-09 | 4.51864375E-09 | 6.21845895E-02 | -3.80158127E-09 | *AMF | 56 | | | |
| 160- | *AMF | 56 | 8.60412185E-09 | 1.11024141E-01 | -3.98779676E-09 | 1.08734852E-08 | *AMF | 57 | | | |
| 161- | *AMF | 57 | 8.76554635E-02 | -6.82580747E-09 | 1.31904123E-08 | 8.02032948E-02 | *AMF | 58 | | | |
| 162- | *AMF | 58 | -8.12668233E-09 | 1.36956544E-09 | 7.74571684E-02 | -8.79216699E-09 | *AMF | 59 | | | |
| 163- | *AMF | 59 | 1.37602107E-08 | 7.63342977E-02 | -9.14720744E-09 | 1.37348137E-08 | *AMF | 60 | | | |
| 164- | *AMF | 60 | 7.58497119E-02 | -9.33530941E-09 | 1.37048808E-08 | 7.56467581E-02 | *AMF | 61 | | | |
| 165- | *AMF | 61 | -9.42648626E-09 | 1.36866412E-08 | 3.77954580E-02 | -6.40362785E-09 | *AMF | 62 | | | |
| 166- | *AMF | 62 | 7.11737158E-09 | | | | *AMF | 63 | | | |
| 167- | OMI | | | | | | | | | | |
| 168- | *AMF | 64 | 4.30269912E-03 | -1.12416187E-09 | -3.80158127E-09 | -2.14204410E-09 | *AMF | 64 | | | |
| 169- | *AMF | 65 | -1.94461114E-09 | 3.98779676E-09 | 2.80496088E-02 | -8.33200176E-10 | *AMF | 65 | | | |
| 170- | *AMF | 66 | -6.82580747E-09 | 1.19862184E-02 | -2.21976394E-09 | -8.12668233E-09 | *AMF | 66 | | | |
| 171- | *AMF | 67 | 5.76997921E-03 | -1.75344161E-09 | -8.79216699E-09 | 2.36523259E-03 | *AMF | 67 | | | |
| 172- | *AMF | 68 | -1.13703069E-09 | -9.14720744E-09 | 1.58918533E-03 | -6.93502766E-10 | *AMF | 68 | | | |
| 173- | *AMF | 69 | -9.33530941E-09 | 8.98981467E-04 | -4.20077505E-10 | -9.42648626E-09 | *AMF | 69 | | | |
| 174- | *AMF | 70 | 5.75681916E-04 | -2.60763413E-10 | -4.71536410E-09 | 2.40501904E-04 | *AMF | 70 | | | |
| 175- | *AMF | 71 | -1.10544240E-10 | | | | *AMF | 71 | | | |
| 176- | OMI | | | | | | | | | | |
| 177- | *AMF | 73 | -1.12416187E-09 | 1.61713064E-03 | 8.50412186E-09 | -1.94461114E-09 | *AMF | 73 | | | |
| 178- | *AMF | 74 | 5.75728559E-03 | 1.08734852E-08 | -8.33200176E-10 | 2.01476067E-02 | *AMF | 74 | | | |
| 179- | *AMF | 75 | 1.31904123E-08 | -2.21976394E-09 | 5.85342571E-03 | 1.36956544E-08 | *AMF | 75 | | | |
| 180- | *AMF | 76 | -1.75344161E-09 | 1.80492387E-03 | 1.37602107E-08 | -1.13703069E-09 | *AMF | 76 | | | |
| 181- | *AMF | 77 | 5.76997921E-04 | 1.37348137E-08 | -6.90502766E-10 | 1.90168270E-04 | *AMF | 77 | | | |
| 182- | *AMF | 78 | 1.37602107E-08 | -4.20077505E-10 | 8.39965512E-05 | 1.30860412E-08 | *AMF | 78 | | | |
| 183- | *AMF | 79 | -2.80763413E-10 | 2.35354353E-05 | 6.84057255E-09 | -1.19282903E-10 | *AMF | 79 | | | |
| 184- | *AMF | 80 | 7.13532063E-06 | | | | *AMF | 80 | | | |
| 185- | OMI | | | | | | | | | | |
| 186- | *AMF | 82 | -2.622533569E-09 | 4.61171306E-09 | 5.49103394E-02 | -5.02532126E-04 | *AMF | 82 | | | |
| 187- | *AMF | 83 | 9.12445586E-09 | 8.76554635E-02 | -6.82580747E-09 | 1.1904123E-08 | *AMF | 83 | | | |
| 188- | *AMF | 84 | 1.36317074E-01 | -7.08914527E-09 | 1.54446838E-08 | 1.12867534E-01 | *AMF | 84 | | | |
| 189- | *AMF | 85 | -9.50683639E-09 | 1.77526183E-08 | 1.05380177E-01 | -1.12892486E-08 | *AMF | 85 | | | |
| 190- | *AMF | 86 | 1.62533775E-08 | 1.02842536E-01 | -1.19606938E-08 | 1.81165945E-08 | *AMF | 86 | | | |
| 191- | *AMF | 87 | 1.01511240E-01 | -1.23037724E-08 | 1.82925323E-08 | 1.01061523E-01 | *AMF | 87 | | | |
| 192- | *AMF | 88 | -1.24778659E-08 | 1.82670474E-08 | 5.04658791E-02 | -8.50303294E-09 | *AMF | 88 | | | |
| 193- | *AMF | 89 | 9.44987732E-09 | | | | *AMF | 89 | | | |
| 194- | OMI | | | | | | | | | | |
| 195- | *AMF | 91 | -2.16825810E-03 | 7.68552697E-10 | -5.02533126E-09 | 5.43110800E-03 | *AMF | 91 | | | |
| 196- | *AMF | 92 | -1.59512425E-09 | -6.82580747E-09 | 1.19862184E-02 | -2.21976394E-09 | *AMF | 92 | | | |
| 197- | *AMF | 93 | -7.08914527E-09 | 2.83216743E-02 | -9.91517535E-10 | -9.90635101E-09 | *AMF | 93 | | | |
| 198- | *AMF | 94 | 1.21797105E-02 | -2.31309480E-02 | -1.12992486E-08 | 5.81198180E-03 | *AMF | 94 | | | |
| 199- | *AMF | 95 | -1.81466464E-09 | -1.14600933E-08 | 3.06723965E-03 | -1.14473075E-09 | *AMF | 95 | | | |
| 200- | *AMF | 96 | -1.23097728E-08 | 1.71109670E-03 | -7.51725703E-10 | -1.24778659E-08 | *AMF | 96 | | | |

SORTED BULK DATA ECHC

| CARD
COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------------|----------|-----------------|-----------------|-----------------|-----------------|----------|---|---|---|----|
| 201- | *AMF 57 | 1.0884800E-03 | -5.1341264E-10 | -5.24230623E-09 | 4.53776447E-04 | *AMF 98 | | | | |
| 202- | *AMF 98 | -2.03331504E-10 | | | | *AMF 99 | | | | |
| 203- | *MFLD | | | | | | | | | |
| 204- | *AMF 100 | -7.6855299E-10 | 5.1612081E-04 | 9.12445586E-09 | -1.59512425E-09 | *AMF 101 | | | | |
| 205- | *AMF 101 | 1.78609043E-03 | 1.31904123E-08 | -2.21975394E-09 | 5.85342571E-03 | *AMF 102 | | | | |
| 206- | *AMF 102 | 1.54446838E-08 | -9.91517535E-10 | 2.01664381E-02 | 1.77526189F-08 | *AMF 103 | | | | |
| 207- | *AMF 103 | -2.31308883E-09 | 5.85933694E-03 | 1.82533775E-08 | -1.81466464E-09 | *AMF 104 | | | | |
| 208- | *AMF 104 | 1.80730480E-03 | 1.83125945E-08 | -1.18863075E-09 | 5.80117805E-04 | *AMF 105 | | | | |
| 209- | *AMF 105 | 1.82425532E-08 | -7.51725793E-10 | 1.92549211E-04 | 1.82670874E-08 | *AMF 106 | | | | |
| 210- | *AMF 106 | -5.1341264E-10 | 7.04100674E-05 | 9.12943321E-09 | -2.19979729E-10 | *AMF 107 | | | | |
| 211- | *AMF 107 | 2.12144951E-05 | | | | *AMF 108 | | | | |
| 212- | *MFLD | | | | | | | | | |
| 213- | *AMF 109 | -2.88329072E-09 | 4.66501210E-09 | 5.22455387E-02 | -5.64961056E-09 | *AMF 110 | | | | |
| 214- | *AMF 110 | 9.19800414E-05 | 8.02032948E-02 | -8.12668333E-09 | 1.36956544E-08 | *AMF 111 | | | | |
| 215- | *AMF 111 | 1.12867534E-01 | -9.56836391E-09 | 1.77526189E-08 | 1.61494017E-01 | *AMF 112 | | | | |
| 216- | *AMF 112 | -1.02517141E-08 | 2.0024033E-08 | 1.38034642E-01 | -1.313689C7E-08 | *AMF 113 | | | | |
| 217- | *AMF 113 | 2.23090026E-08 | 1.30557060E-01 | -1.44518175E-08 | 2.2811C973E-08 | *AMF 114 | | | | |
| 218- | *AMF 114 | 1.278364C6E-01 | -1.51032502E-08 | 2.28788011E-08 | 1.26804173E-01 | *AMF 115 | | | | |
| 219- | *AMF 115 | -1.54111248E-08 | 2.28637553E-08 | 6.32660985E-02 | -1.05578728E-08 | *AMF 116 | | | | |
| 220- | *AMF 116 | 1.18903145E-08 | | | | *AMF 117 | | | | |
| 221- | *MFLD | | | | | | | | | |
| 222- | *AMF 118 | 1.13540888E-03 | -4.7082380E-10 | -5.64061056E-09 | -2.77573429E-03 | *AMF 119 | | | | |
| 223- | *AMF 119 | -1.04365580E-09 | -8.12668333E-09 | 5.76797921E-03 | -1.75344161E-08 | *AMF 120 | | | | |
| 224- | *AMF 120 | -5.96836391E-09 | 1.2157165E-02 | -2.31308883E-09 | -1.02517141E-08 | *AMF 121 | | | | |
| 225- | *AMF 121 | 2.85033807E-02 | -1.05274056E-09 | -1.31368907E-08 | 1.22777224E-02 | *AMF 122 | | | | |
| 226- | *AMF 122 | -2.36468889E-09 | -1.44518175E-08 | 6.0137820E-03 | -1.87586745E-09 | *AMF 123 | | | | |
| 227- | *AMF 123 | -1.51032502E-08 | 3.25673795E-03 | -1.28196564E-09 | -1.54111248E-08 | *AMF 124 | | | | |
| 228- | *AMF 124 | 2.04296177E-03 | -9.10043152E-10 | -7.71066055E-09 | 8.47978052E-04 | *AMF 125 | | | | |
| 229- | *AMF 125 | -3.63987729E-10 | | | | *AMF 126 | | | | |
| 230- | *MFLD | | | | | | | | | |
| 231- | *AMF 127 | -4.70962380E-10 | 1.68953789E-04 | 9.19800414E-09 | -1.04365580E-09 | *AMF 128 | | | | |
| 232- | *AMF 128 | 5.72260235E-04 | 1.36956544E-08 | -1.75344161E-09 | 1.80492337E-03 | *AMF 129 | | | | |
| 233- | *AMF 129 | 1.77526189E-08 | -2.31308883E-09 | 5.85933694E-03 | 2.0024033E-08 | *AMF 130 | | | | |
| 234- | *AMF 130 | -1.05274056E-09 | 2.01688185E-02 | 2.23090026E-08 | -2.36468889E-09 | *AMF 131 | | | | |
| 235- | *AMF 131 | 5.86128235E-03 | 2.28110970E-08 | -1.87594745E-09 | 1.80968572E-03 | *AMF 132 | | | | |
| 236- | *AMF 132 | 2.28788011E-08 | -1.28196564E-09 | 5.8653092E-04 | 2.28637553E-08 | *AMF 133 | | | | |
| 237- | *AMF 133 | -5.10043152E-10 | 2.11302750E-04 | 1.14282166E-08 | -3.95587119E-10 | *AMF 134 | | | | |
| 238- | *AMF 134 | 6.32747397E-05 | | | | *AMF 135 | | | | |
| 239- | *MFLD | | | | | | | | | |
| 240- | *AMF 136 | -3.02422776E-09 | 4.58629040E-09 | 5.11574484E-02 | -5.64961056E-09 | *AMF 137 | | | | |
| 241- | *AMF 137 | 9.17711418E-05 | 7.74573684E-02 | -8.79210699E-09 | 1.37602107E-08 | *AMF 138 | | | | |
| 242- | *AMF 138 | 1.05300177E-01 | -1.12892480E-08 | 1.82533775E-08 | 1.38034642E-01 | *AMF 139 | | | | |
| 243- | *AMF 139 | -1.313089C7E-08 | 2.23090026E-08 | 1.80670899E-01 | -1.34142830E-08 | *AMF 140 | | | | |
| 244- | *AMF 140 | 2.45001264E-08 | 1.63286572E-01 | -1.62794471E-08 | 2.68712093E-08 | *AMF 141 | | | | |
| 245- | *AMF 141 | 1.55850053E-01 | -1.75531096E-08 | 2.73822955E-08 | 1.53307080E-01 | *AMF 142 | | | | |
| 246- | *AMF 142 | -1.81274704E-08 | 2.74665091E-08 | 7.63343573E-02 | -1.25333810E-08 | *AMF 143 | | | | |
| 247- | *AMF 143 | 1.42942262E-08 | | | | *AMF 144 | | | | |
| 248- | *MFLD | | | | | | | | | |
| 249- | *AMF 145 | 6.07476337E-04 | -2.75142797E-10 | -5.98463856E-09 | 1.46727962E-03 | *AMF 146 | | | | |
| 250- | *AMF 146 | -8.25279901E-10 | -8.79210699E-09 | 2.96523259E-03 | -1.13701069E-09 | *AMF 147 | | | | |

SORTED BULK DATA ECHO

| CARD
COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------------|----------|-----------------|-----------------|-----------------|-----------------|----------|---|---|---|----|
| 251- | *AMF 147 | -1.12892486E-08 | 5.8916813E-03 | -1.81460464E-09 | -1.31368907E-08 | *AMF 148 | | | | |
| 252- | *AMF 148 | 1.22777224E-02 | 2.23468845E-09 | -1.34142830E-08 | 2.86252871E-02 | *AMF 149 | | | | |
| 253- | *AMF 149 | 1.11356337E-09 | -1.62794471E-08 | 1.24672204E-02 | -2.45802378E-09 | *AMF 150 | | | | |
| 254- | *AMF 150 | -1.75531696E-08 | 6.34565919E-03 | -2.03420503E-09 | -1.81274764E-08 | *AMF 151 | | | | |
| 255- | *AMF 151 | 3.86421406E-03 | -1.55710814E-09 | -9.07152042E-09 | 1.56918533E-03 | *AMF 152 | | | | |
| 256- | *AMF 152 | -6.33736841E-10 | | | | *AMF 153 | | | | |
| 257- | DMI | *MFLD | 18 | | | | | | | |
| 258- | *AMF 154 | -2.75142757E-10 | 5.61394263E-05 | 9.17711418E-09 | -6.29279961E-10 | *AMF 155 | | | | |
| 259- | *AMF 155 | 1.87787344E-04 | 1.37602107E-08 | -1.13703069E-09 | 5.78673324E-04 | *AMF 156 | | | | |
| 260- | *AMF 156 | 1.82533775E-08 | -1.81466444E-09 | 1.80730480E-03 | 2.23090026E-08 | *AMF 157 | | | | |
| 261- | *AMF 157 | -2.36468889E-09 | 5.86128235E-03 | 2.45631024E-08 | -1.11796237E-09 | *AMF 158 | | | | |
| 262- | *AMF 158 | 2.01712027E-02 | 2.68712043E-08 | -2.45802378E-09 | 5.86769357E-03 | *AMF 159 | | | | |
| 263- | *AMF 159 | 2.73832955E-08 | -2.03420503E-09 | 1.82851939E-03 | 2.74650915E-08 | *AMF 160 | | | | |
| 264- | *AMF 160 | -1.55710844E-09 | 6.42670310E-04 | 1.37394203E-08 | -6.94437174E-10 | *AMF 161 | | | | |
| 265- | *AMF 161 | 1.90168255E-04 | | | | *AMF 162 | | | | |
| 266- | DMI | *MFLD | 19 | | | | | | | |
| 267- | *AMF 163 | -3.10135118E-09 | 4.57119833E-02 | 5.06825671E-02 | -6.16678264E-09 | *AMF 164 | | | | |
| 268- | *AMF 164 | 5.1449707E-09 | 7.63342977E-02 | -9.14723744E-09 | 1.37348337E-08 | *AMF 165 | | | | |
| 269- | *AMF 165 | 1.02624536E-01 | -1.19606938E-08 | 1.83165945E-08 | 1.30557060E-01 | *AMF 166 | | | | |
| 270- | *AMF 166 | -1.44518175E-08 | 2.28110970E-08 | 1.63246572E-01 | -1.62794471E-08 | *AMF 167 | | | | |
| 271- | *AMF 167 | 2.68712092E-08 | 2.11563892E-01 | -1.65156315E-08 | 2.91313249E-08 | *AMF 168 | | | | |
| 272- | *AMF 168 | 1.88717246E-01 | -1.93036713E-08 | 3.14571997E-08 | 1.81714535E-01 | *AMF 169 | | | | |
| 273- | *AMF 169 | -2.04364556E-08 | 3.19882112E-08 | 9.00409818E-02 | -1.43711354E-08 | *AMF 170 | | | | |
| 274- | *AMF 170 | 1.66982410E-08 | | | | *AMF 171 | | | | |
| 275- | DMI | *MFLD | 20 | | | | | | | |
| 276- | *AMF 172 | 3.21470979E-04 | -1.58317545E-10 | -6.16678264E-09 | 7.96974637E-08 | *AMF 173 | | | | |
| 277- | *AMF 173 | -3.68477693E-10 | -9.14720744E-09 | 1.58918533E-03 | -6.90502766E-10 | *AMF 174 | | | | |
| 278- | *AMF 174 | -1.19606938E-08 | 3.06723905E-03 | -1.18363075E-09 | -1.44518175E-08 | *AMF 175 | | | | |
| 279- | *AMF 175 | 6.01370828E-03 | -1.87508745E-09 | -1.62794471E-08 | 1.24672204E-02 | *AMF 176 | | | | |
| 280- | *AMF 176 | -2.45802378E-09 | 1.65156315E-08 | 2.89571583E-02 | -1.27228755E-09 | *AMF 177 | | | | |
| 281- | *AMF 177 | -1.93036733E-08 | 1.30746915E-02 | -2.73316658E-09 | -2.04364556E-08 | *AMF 178 | | | | |
| 282- | *AMF 178 | 7.48106837E-03 | -2.50516741E-09 | -1.02327782E-08 | 3.01623624E-03 | *AMF 179 | | | | |
| 283- | *AMF 179 | -1.0559002E-09 | | | | *AMF 180 | | | | |
| 284- | DMI | *MFLD | 21 | | | | | | | |
| 285- | *AMF 181 | -1.58317554E-10 | 1.88335543E-05 | 9.14899707E-09 | -3.68477693E-10 | *AMF 182 | | | | |
| 286- | *AMF 182 | 6.25525427E-05 | 1.37348337E-08 | -6.90502766E-10 | 1.90168270E-04 | *AMF 183 | | | | |
| 287- | *AMF 183 | 1.83165945E-08 | -1.18863075E-09 | 5.80117805E-04 | 2.24110370E-08 | *AMF 184 | | | | |
| 288- | *AMF 184 | -1.87508745E-09 | 1.80968572E-03 | 2.68712093E-08 | -2.45802378E-09 | *AMF 185 | | | | |
| 289- | *AMF 185 | 5.86769357E-03 | 2.51313249E-08 | -1.27228755E-09 | 2.01900341E-02 | *AMF 186 | | | | |
| 290- | *AMF 186 | 3.14574597E-08 | -2.73316658E-09 | 5.92383370E-03 | 3.19882112E-08 | *AMF 187 | | | | |
| 291- | *AMF 187 | -2.50516741E-09 | 1.95747485E-03 | 1.60523754E-08 | -1.17461624E-09 | *AMF 188 | | | | |
| 292- | *AMF 188 | 5.79394533E-04 | | | | *AMF 189 | | | | |
| 293- | DMI | *MFLD | 22 | | | | | | | |
| 294- | *AMF 190 | -3.14255566E-09 | 4.56220641E-09 | 5.04690715E-02 | -6.29279961E-10 | *AMF 191 | | | | |
| 295- | *AMF 191 | 9.12892162E-09 | 7.58497119E-02 | -9.33530941E-09 | 1.37048080E-08 | *AMF 192 | | | | |
| 296- | *AMF 192 | 1.01511240E-01 | -1.23057728E-08 | 1.82925532E-08 | 1.27836406E-01 | *AMF 193 | | | | |
| 297- | *AMF 193 | -1.51133202E-08 | 2.28788011E-08 | 1.55850053E-01 | -1.75531696E-08 | *AMF 194 | | | | |
| 298- | *AMF 194 | 2.73832955E-08 | 1.88716244E-01 | -1.93036733E-08 | 3.14574597E-08 | *AMF 195 | | | | |
| 299- | *AMF 195 | 2.37822374E-01 | -1.93984216E-08 | 3.3737370E-08 | 2.15492070E-01 | *AMF 196 | | | | |
| 300- | *AMF 196 | -2.19290612E-08 | 3.60692114E-08 | 1.05360177E-01 | -1.59644848E-08 | *AMF 197 | | | | |

MAY 4. 1974 NASIRAN 5/13/72

AXISYMMETRIC CIRC. CYL. WITH FLUID
HARMONIC REDUCTION

SORTED BULK DATA ECHC

| CARD
COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------------|----------|-----------------|-----------------|-----------------|---|---|---|---|---|-----------------|
| 301- | *AMF 197 | 1.90256237E-08 | 23 | | | | | | | *AMF 198 |
| 302- | DMI | *MFLD | | | | | | | | *AMF 199 |
| 303- | *AMF 199 | 1.89498416E-04 | -9.3334937CE-11 | -6.26391738E-09 | | | | | | -3.1425566CE-09 |
| 304- | *AMF 200 | -2.19540483E-10 | -9.33530941E-09 | 8.98981467E-04 | | | | | | 4.53776447E-04 |
| 305- | *AMF 201 | -1.23097728E-08 | 1.71109079E-03 | -7.51725793E-10 | | | | | | -4.20077750E-10 |
| 306- | *AMF 202 | 3.25673755E-03 | -1.28136554E-09 | 1.75531696E-08 | | | | | | -1.51032502E-08 |
| 307- | *AMF 203 | -2.03420603E-09 | -1.93036733E-08 | 1.30746961E-02 | | | | | | 6.34565949E-03 |
| 308- | *AMF 204 | -1.93989216E-08 | 3.00925672E-02 | -1.74324311E-09 | | | | | | -2.73316658E-09 |
| 309- | *AMF 205 | 1.52429529E-02 | -3.5017193CE-09 | -1.10086411E-08 | | | | | | -2.19290612E-08 |
| 310- | *AMF 206 | -1.60420459E-09 | | | | | | | | 5.8918E188E-03 |
| 311- | DMI | *MFLD | 24 | | | | | | | *AMF 207 |
| 312- | *AMF 208 | -9.3334937CE-11 | 6.41311362E-06 | 9.12892162E-09 | | | | | | 4.56222661E-09 |
| 313- | *AMF 209 | 2.12144951E-05 | 1.37044608E-08 | -4.20077750E-10 | | | | | | -2.19540483E-10 |
| 314- | *AMF 210 | 1.82925532E-08 | -7.51725793E-10 | 1.92549211E-04 | | | | | | 6.39969512E-05 |
| 315- | *AMF 211 | -1.28196564E-09 | 5.86530892E-04 | 2.73822955E-08 | | | | | | 2.28783011E-08 |
| 316- | *AMF 212 | 1.82851939E-03 | 3.14574997E-08 | -2.73316658E-09 | | | | | | -2.03420603E-09 |
| 317- | *AMF 213 | 3.37372370E-08 | -1.74324311E-09 | 2.03589872E-02 | | | | | | 5.92383370E-02 |
| 318- | *AMF 214 | -3.5017193CE-09 | 6.43995404E-03 | 1.82969551E-08 | | | | | | 3.60692134E-08 |
| 319- | *AMF 215 | 1.80730456E-03 | | | | | | | | -1.85204985E-09 |
| 320- | DMI | *MFLD | 25 | | | | | | | *AMF 216 |
| 321- | *AMF 217 | -3.16256843E-09 | 4.55771954E-09 | 5.03790267E-02 | | | | | | 2.51769051E-02 |
| 322- | *AMF 218 | 9.11859033E-09 | 7.56437581E-02 | -9.42648626E-09 | | | | | | -6.31108321E-09 |
| 323- | *AMF 219 | 1.01061583E-01 | -1.24778659E-08 | 1.82670674E-08 | | | | | | 1.36866412E-08 |
| 324- | *AMF 220 | -1.54111248E-08 | 2.28637533E-08 | 1.53307080E-01 | | | | | | 1.26864173E-01 |
| 325- | *AMF 221 | 2.74650915E-08 | 1.81714535E-01 | -2.04364596E-08 | | | | | | -1.21274764E-08 |
| 326- | *AMF 222 | 2.15492070E-01 | -2.19290612E-08 | 3.60692134E-08 | | | | | | 3.19882112E-08 |
| 327- | *AMF 223 | -2.15492070E-01 | 3.82557808E-08 | 1.25451038E-01 | | | | | | 2.66873194E-01 |
| 328- | *AMF 224 | 2.09501430E-08 | | | | | | | | -1.71183174E-08 |
| 329- | DMI | *MFLD | 26 | | | | | | | *AMF 225 |
| 330- | *AMF 226 | 1.21905570E-04 | -6.12229434E-11 | -8.31108321E-09 | | | | | | -3.16256843E-09 |
| 331- | *AMF 227 | -1.44935050E-10 | -9.42648626E-09 | 5.75681916E-04 | | | | | | 2.91505363E-04 |
| 332- | *AMF 228 | -1.24778659E-08 | 1.08880000E-03 | -5.13412646E-10 | | | | | | -2.80763413E-10 |
| 333- | *AMF 229 | 2.04296177E-03 | -9.10043152E-10 | -1.81274764E-08 | | | | | | -1.54111248E-08 |
| 334- | *AMF 230 | -1.55710844E-09 | -2.04364596E-08 | 7.48106837E-03 | | | | | | 3.06421406E-03 |
| 335- | *AMF 231 | -2.19290612E-08 | 1.52429529E-02 | -3.5017193CE-09 | | | | | | -2.50516741E-09 |
| 336- | *AMF 232 | 3.3952626E-02 | -2.86740494E-09 | -1.09703109E-08 | | | | | | -2.15409663E-08 |
| 337- | *AMF 233 | -1.90214733E-09 | | | | | | | | 1.22267194E-02 |
| 338- | DMI | *MFLD | 27 | | | | | | | *AMF 234 |
| 339- | *AMF 235 | -6.12229434E-11 | 2.38053738E-05 | 9.11859033E-09 | | | | | | 4.55771954E-09 |
| 340- | *AMF 236 | 7.85752854E-06 | 1.36866412E-08 | -2.80763413E-10 | | | | | | -1.44935050E-10 |
| 341- | *AMF 237 | 1.82670674E-08 | -5.13412646E-10 | 7.04100676E-05 | | | | | | 2.35954354E-05 |
| 342- | *AMF 238 | -9.10043152E-10 | 2.11382750E-04 | 2.74050915E-08 | | | | | | 2.28637533E-08 |
| 343- | *AMF 239 | 6.42670086E-04 | 3.19882112E-08 | -2.50516741E-09 | | | | | | -1.55710844E-09 |
| 344- | *AMF 240 | 3.60692134E-08 | -3.5017193CE-09 | 6.43995404E-03 | | | | | | 1.99747295E-03 |
| 345- | *AMF 241 | -2.86740494E-09 | 2.19761249E-02 | 2.01721200E-08 | | | | | | 3.82557808E-08 |
| 346- | *AMF 242 | 5.86055964E-03 | | | | | | | | -2.46011583E-09 |
| 347- | DMI | *MFLD | 28 | | | | | | | *AMF 243 |
| 348- | *AMF 244 | -1.5818355E-09 | 2.27821051E-09 | 2.51769051E-02 | | | | | | 1.25823579E-02 |
| 349- | *AMF 245 | 4.55777993E-09 | 3.77955580E-02 | -4.7153641CE-09 | | | | | | -3.16256843E-09 |
| 350- | *AMF 246 | 5.04096751E-02 | -6.24230623E-09 | 9.12343321E-09 | | | | | | 6.84057255E-09 |

ORIGINAL PAGE IS
OF POOR QUALITY

SORTED BULK DATA ECHC

| CARD
COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------------|----------|------------------|-----------------|-----------------|-----------------|-----------------|---|---|---|----|
| 351- | *AMF 247 | -7.71066055E-09 | 1.14282164E-08 | 7.63343573E-02 | -9.07152042E-09 | *AMF 248 | | | | |
| 352- | *AMF 248 | 1.37394203E-08 | 9.0409810E-02 | -1.02327782E-08 | 1.60523754E-08 | *AMF 249 | | | | |
| 353- | *AMF 249 | 1.05380177E-01 | -1.1008641E-08 | 1.82969551E-08 | 1.25451088E-01 | *AMF 250 | | | | |
| 354- | *AMF 250 | -1.05703109E-08 | 2.01721200E-08 | 8.07470083E-02 | -8.02946687E-09 | *AMF 251 | | | | |
| 355- | *AMF 251 | 1.08360823E-08 | | | | *AMF 252 | | | | |
| 356- | DMI | *MFLD | 29 | | | | | | | |
| 357- | *AMF 253 | 5.10035024E-05 | -2.58151139E-11 | -4.27954916E-09 | 1.21905570E-04 | *AMF 254 | | | | |
| 358- | *AMF 254 | -6.12724038E-11 | -6.4036278E-09 | 2.40501904E-04 | -1.19282903E-10 | *AMF 255 | | | | |
| 359- | *AMF 255 | -8.50303294E-09 | 4.53776447E-04 | -2.19979729E-10 | -1.05578728E-08 | *AMF 256 | | | | |
| 360- | *AMF 256 | 8.47978052E-04 | 3.95567115E-10 | 1.25338104E-08 | 1.58919533E-03 | *AMF 257 | | | | |
| 361- | *AMF 257 | -8.94443717E-10 | -1.43711354E-08 | 3.01623624E-03 | -1.17481624E-09 | *AMF 258 | | | | |
| 362- | *AMF 258 | -1.55644848E-08 | 5.6518181E-03 | -1.85204985E-09 | -1.71183174E-08 | *AMF 259 | | | | |
| 363- | *AMF 259 | 1.22267194E-02 | -2.46011589E-09 | -8.02946687E-09 | 1.42516978E-02 | *AMF 260 | | | | |
| 364- | *AMF 260 | -2.25891930E-10 | | | | *AMF 261 | | | | |
| 365- | DMI | *MFLD | 30 | | | | | | | |
| 366- | *AMF 262 | -2.35978222E-11 | 7.22207031E-07 | 4.74222261E-09 | -5.68684683E-11 | *AMF 263 | | | | |
| 367- | *AMF 263 | 2.36093617E-06 | 7.11737158E-09 | -1.10544240E-10 | 7.13532063E-06 | *AMF 264 | | | | |
| 368- | *AMF 264 | 5.45877332E-09 | -2.03331504E-10 | 2.12144951E-05 | 1.18903145E-08 | *AMF 265 | | | | |
| 369- | *AMF 265 | -3.63987729E-10 | 6.32747397E-05 | 1.42942262E-08 | -6.33736841E-10 | *AMF 266 | | | | |
| 370- | *AMF 266 | 1.90168255E-04 | 1.66982410E-08 | 1.05509062E-09 | 5.79395331E-04 | *AMF 267 | | | | |
| 371- | *AMF 267 | 1.90256237E-08 | -1.60424495E-09 | 1.80730456E-03 | 2.09501430E-08 | *AMF 268 | | | | |
| 372- | *AMF 268 | -1.90214733E-09 | 5.86055964E-03 | 1.08360823E-08 | -2.25891930E-10 | *AMF 269 | | | | |
| 373- | *AMF 269 | 1.00644130E-02 | | | | *AMF 270 | | | | |
| 374- | DMI | *PDU2 | 0 | 1 | 2 | 30 | | | | |
| 375- | DMI | *PDU2 | 1 | | | 1.78615928E-01 | | | | |
| 376- | *APD 1 | 5.23188142E-08 | -5.4430601E-08 | 1.12713993E-01 | 2.13113509E-08 | *APD 2 | | | | |
| 377- | *APD 2 | -1.5658585E-08 | 9.24588640E-02 | 9.95564475E-09 | -4.79478857E-09 | *APD 3 | | | | |
| 378- | *APD 3 | 8.52270126E-02 | 5.01694686E-09 | -1.53029167E-09 | 8.23292136E-02 | *APD 4 | | | | |
| 379- | *APD 4 | 2.62712541E-09 | -5.00945729E-10 | 8.10757279E-02 | 1.40558765E-09 | *APD 5 | | | | |
| 380- | *APD 5 | -1.66452699E-10 | 8.05100203E-02 | 7.67887975E-10 | -5.58412760E-11 | *APD 6 | | | | |
| 381- | *APD 6 | 8.02519321E-02 | 4.32844154E-10 | -1.90147847E-11 | 8.01405007E-02 | *APD 7 | | | | |
| 382- | *APD 7 | 2.82666814E-10 | -7.05944704E-12 | 8.01095366E-02 | 2.36025199E-10 | *APD 8 | | | | |
| 383- | *APD 8 | -4.28267144E-12 | | | | *APD 9 | | | | |
| 384- | DMI | *PDU2 | 2 | 1 | | -2.27336812E-08 | | | | |
| 385- | *APD 10 | 1.44541204E-01 | 8.03613034E-08 | -1.43558866E-08 | 5.83768181E-02 | *APD 11 | | | | |
| 386- | *APD 11 | 2.31136390E-04 | -1.17757786E-08 | 2.75044851E-02 | 7.07758829E-09 | *APD 12 | | | | |
| 387- | *APD 12 | -1.08550544E-08 | 1.38603203E-02 | 2.25886332E-09 | -1.04859836E-08 | *APD 13 | | | | |
| 388- | *APD 13 | 7.25796074E-03 | 7.39446060E-10 | -1.03263353E-08 | 3.88321363E-03 | *APD 14 | | | | |
| 389- | *APD 14 | 2.45700793E-10 | -1.02542828E-08 | 2.12144526E-03 | 8.24273011E-11 | *APD 15 | | | | |
| 390- | *APD 15 | -1.02214059E-08 | 1.21134543E-04 | 2.80677426E-11 | -1.02072271E-08 | *APD 16 | | | | |
| 391- | *APD 16 | 7.792266409E-04 | 1.04204301E-11 | -1.02032720E-08 | 6.53067130E-04 | *APD 17 | | | | |
| 392- | *APD 17 | 6.32165967E-12 | | | | *APD 18 | | | | |
| 393- | DMI | *PDU2 | 3 | 1 | | 3.23422036E-08 | | | | |
| 394- | *APD 19 | -7.44992121E-08 | 1.18340304E-01 | 2.04092636E-08 | -3.0382429E-08 | *APD 20 | | | | |
| 395- | *APD 20 | 3.41805653E-02 | 1.67410574E-08 | -1.41763188E-08 | 1.04664937E-02 | *APD 21 | | | | |
| 396- | *APD 21 | 1.54321608E-08 | -7.14336772E-09 | 3.34045757E-03 | 1.49074530E-08 | *APD 22 | | | | |
| 397- | *APD 22 | -3.740886071E-09 | 1.22300914E-03 | 1.46804870E-08 | -2.00149276E-09 | *APD 23 | | | | |
| 398- | *APD 23 | 3.63347816E-04 | 1.45780525E-08 | -1.09343791E-09 | 1.21895340E-04 | *APD 24 | | | | |
| 399- | *APD 24 | 1.45313130E-08 | -6.24349905E-10 | 4.15071991E-05 | 1.4511549E-08 | *APD 25 | | | | |
| 400- | *APD 25 | -4.01648270E-10 | 1.54099835E-05 | 1.45055346E-08 | -3.36087380E-10 | *APD 26 | | | | |

S O R T E D B U L K D A T A E C H O

| CARD | COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------|-------|----|-----------------|-----------------|-----------------|---|---|---|---|-----------------|---------|
| 401- | *APD | 26 | 9.34855872E-06 | | | | | | | | *APD 27 |
| 402- | DMI | | *PDU2 | | | | | | | | |
| 403- | *APD | 28 | 2.13113509E-08 | -1.56585855E-08 | | | | | | 1.12713993E-01 | *APD 28 |
| 404- | *APD | 29 | 5.92364486E-08 | 1.57941005E-01 | 2.63282978E-08 | | | | | -1.71868779E-08 | *APD 29 |
| 405- | *APD | 30 | 1.74785078E-01 | 1.25827739E-08 | -5.29573195E-09 | | | | | 1.66302741E-01 | *APD 30 |
| 406- | *APD | 31 | 6.42253184E-09 | -1.65674430E-09 | 1.62832345E-01 | | | | | 3.39501316E-09 | *APD 31 |
| 407- | *APD | 32 | -5.56786839E-10 | 1.61327600E-01 | 1.84405158E-09 | | | | | -1.85467429E-10 | *APD 32 |
| 408- | *APD | 33 | 1.60650611E-01 | 1.04995479E-09 | -6.29007124E-11 | | | | | 1.60361469E-01 | *APD 33 |
| 409- | *APD | 34 | 6.74489353E-10 | -2.32974612E-11 | 1.60281181E-01 | | | | | 5.64133629E-10 | *APD 34 |
| 410- | *APD | 35 | -1.4118910E-11 | | | | | | | | *APD 35 |
| 411- | DMI | | *PDU2 | | | | | | | | |
| 412- | *APD | 37 | 5.88768981E-02 | 2.31163905E-08 | -3.45254598E-08 | | | | | -1.43559866E-08 | *APD 37 |
| 413- | *APD | 38 | 8.74388775E-08 | -2.52110510E-08 | 7.27372159E-02 | | | | | 1.72045708E-01 | *APD 38 |
| 414- | *APD | 39 | -2.22617622E-08 | 3.47624458E-02 | 7.81703235E-09 | | | | | -2.11813962E-08 | *APD 39 |
| 415- | *APD | 40 | 1.77435428E-02 | 2.50456411E-09 | -2.07402664E-08 | | | | | 9.37940553E-03 | *APD 40 |
| 416- | *APD | 41 | 8.21673236E-10 | -2.05477377E-08 | 5.09456173E-03 | | | | | 2.73768341E-10 | *APD 41 |
| 417- | *APD | 42 | -2.04615063E-08 | 2.90071149E-03 | 9.28477434E-11 | | | | | -2.04240753E-08 | *APD 42 |
| 418- | *APD | 43 | 1.86341233E-03 | 3.43893941E-11 | -2.04144530E-08 | | | | | 1.55853271E-03 | *APD 43 |
| 419- | *APD | 44 | 2.08408846E-11 | | | | | | | | *APD 44 |
| 420- | DMI | | *PDU2 | | | | | | | | |
| 421- | *APD | 46 | -3.03462429E-08 | 3.41809653E-02 | 4.90832974E-08 | | | | | 2.04002636E-08 | *APD 46 |
| 422- | *APD | 47 | 1.29306614E-01 | 3.58414205E-08 | -3.74901106E-08 | | | | | -8.86755060E-08 | *APD 47 |
| 423- | *APD | 48 | 3.16485469E-08 | -1.79172055E-08 | 1.15600042E-02 | | | | | 3.75214219E-02 | *APD 48 |
| 424- | *APD | 49 | -9.14534937E-09 | 3.70390539E-03 | 2.94855056E-08 | | | | | 3.01126448E-08 | *APD 49 |
| 425- | *APD | 50 | 1.21540460E-03 | 2.92117974E-08 | -2.62583244E-09 | | | | | 4.83431961E-09 | *APD 50 |
| 426- | *APD | 51 | 2.90892075E-08 | -1.49508028E-09 | 1.37305324E-04 | | | | | 4.04855004E-04 | *APD 51 |
| 427- | *APD | 52 | -9.86643728E-10 | 5.08558005E-05 | 2.90223099E-08 | | | | | 2.90368476E-08 | *APD 52 |
| 428- | *APD | 53 | 3.08156669E-05 | | | | | | | -8.03296540E-10 | *APD 53 |
| 429- | DMI | | *PDU2 | | | | | | | | |
| 430- | *APD | 55 | 9.95564875E-09 | -4.79478657E-09 | 1.97941005E-01 | | | | | 9.245584640E-02 | *APD 55 |
| 431- | *APD | 56 | -1.71868779E-08 | 3.53801005E-01 | 6.49015419E-08 | | | | | 2.63282978E-08 | *APD 56 |
| 432- | *APD | 57 | 2.79016793E-01 | 2.77336827E-08 | -1.73553296E-08 | | | | | -5.97373742E-08 | *APD 57 |
| 433- | *APD | 58 | 1.33506610E-08 | -5.35157341E-09 | 2.46554673E-01 | | | | | 2.55295059E-01 | *APD 58 |
| 434- | *APD | 59 | -1.71575909E-09 | 2.42975625E-01 | 3.67707997E-09 | | | | | 6.86099710E-09 | *APD 59 |
| 435- | *APD | 60 | 2.41437197E-01 | 2.08076771E-09 | -1.89759160E-10 | | | | | -5.63846303E-10 | *APD 60 |
| 436- | *APD | 61 | 1.33202160E-09 | -6.99601627E-11 | 2.40613401E-01 | | | | | 2.40791202E-01 | *APD 61 |
| 437- | *APD | 62 | -4.23122509E-11 | | | | | | | 1.11295329E-09 | *APD 62 |
| 438- | DMI | | *PDU2 | | | | | | | | |
| 439- | *APD | 64 | 2.75044851E-02 | 7.07758829E-09 | -2.52110510E-08 | | | | | -1.17757786E-08 | *APD 64 |
| 440- | *APD | 65 | 2.53725005E-08 | -4.50114394E-08 | 1.79303646E-01 | | | | | 7.27372169E-02 | *APD 65 |
| 441- | *APD | 66 | -2.25537382E-08 | 7.66294000E-02 | 2.56192027E-08 | | | | | 8.91783535E-08 | *APD 66 |
| 442- | *APD | 67 | 3.08838906E-02 | 7.89945806E-09 | -3.14028021E-08 | | | | | -3.25160414E-08 | *APD 67 |
| 443- | *APD | 68 | 2.53263184E-09 | -3.05474895E-08 | 1.01596720E-02 | | | | | 1.89548800E-02 | *APD 68 |
| 444- | *APD | 69 | -3.67510136E-08 | 5.74662904E-03 | 2.00301731E-10 | | | | | 8.32293567E-10 | *APD 69 |
| 445- | *APD | 70 | 3.67597750E-03 | 1.03268130E-10 | -3.06466012E-08 | | | | | -3.06687298E-08 | *APD 70 |
| 446- | *APD | 71 | 8.24571089E-11 | | | | | | | 3.07475729E-03 | *APD 71 |
| 447- | DMI | | *PDU2 | | | | | | | | |
| 448- | *APD | 73 | -1.41763162E-08 | 1.04664337E-02 | 3.59414223E-08 | | | | | 1.67416474E-08 | *APD 73 |
| 449- | *APD | 74 | 3.75214219E-02 | 6.39907394E-08 | -9.24164283E-08 | | | | | -3.74901106E-08 | *APD 74 |
| 450- | *APD | 75 | 5.05219049E-08 | -3.94915922E-08 | 3.78847681E-02 | | | | | 1.30400121E-01 | *APD 75 |
| | | | | | | | | | | 4.62205554E-03 | *APD 76 |

SORTED BULK DATA ECHG

| CARD | COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------|-------|-------|------------------|-----------------|-----------------|-----------------|------|-----|---|---|----|
| 451- | *APD | 76 | -1.90106384E-08 | 1.16818994E-02 | 4.46439543E-08 | -9.76969972E-09 | *APD | 77 | | | |
| 452- | *APD | 77 | 3.74531257E-03 | 4.39506570E-08 | -5.23596810E-09 | 1.23081449E-03 | *APD | 78 | | | |
| 453- | *APD | 78 | 4.37173320E-08 | -2.96191982E-09 | 4.14203620E-04 | 4.36003589E-08 | *APD | 79 | | | |
| 454- | *APD | 79 | -1.8967285E-09 | 1.52715307E-04 | 4.35681571E-08 | -1.58478657E-09 | *APD | 80 | | | |
| 455- | *APD | 80 | 9.23629705E-05 | | | | *APD | 81 | | | |
| 456- | DMI | *PDU2 | 10 | 1 | 8.52270126E-02 | | *APD | 82 | | | |
| 457- | *APD | 82 | 5.01694686E-09 | -1.53029167E-09 | 1.74785078E-01 | 1.25827739E-09 | *APD | 83 | | | |
| 458- | *APD | 83 | -5.29573185E-09 | 2.79016793E-01 | 2.77338827E-08 | -1.73553296E-08 | *APD | 84 | | | |
| 459- | *APD | 84 | 4.33911026E-01 | 6.56694397E-08 | -5.97931944E-08 | 3.59268665E-01 | *APD | 85 | | | |
| 460- | *APD | 85 | 2.81723480E-08 | -1.73743437E-08 | 3.35435688E-01 | 1.36327287E-08 | *APD | 86 | | | |
| 461- | *APD | 86 | -5.35803265E-09 | 3.26664204E-01 | 7.09792164E-09 | -1.72004165E-09 | *APD | 87 | | | |
| 462- | *APD | 87 | 3.23123475E-01 | 3.95514412E-09 | -3.76905767E-10 | 3.21689129E-01 | *APD | 88 | | | |
| 463- | *APD | 88 | 2.51854071E-09 | -2.08764938E-10 | 3.21301281E-01 | 2.09000914E-09 | *APD | 89 | | | |
| 464- | *APD | 89 | -1.25801397E-10 | | | | *APD | 90 | | | |
| 465- | DMI | *PDU2 | 11 | 1 | -1.08550644E-08 | | *APD | 91 | | | |
| 466- | *APD | 91 | 1.38603263E-02 | 2.25886332E-09 | -2.22617622E-08 | 3.47624458E-02 | *APD | 92 | | | |
| 467- | *APD | 92 | 7.81703235E-09 | -3.55374024E-06 | 7.66204000E-02 | 2.56182077E-08 | *APD | 93 | | | |
| 468- | *APD | 93 | -5.52657227E-08 | 1.81425093E-01 | 8.82607765E-08 | -4.57587380E-08 | *APD | 94 | | | |
| 469- | *APD | 94 | 7.78317451E-02 | 2.56462091E-08 | -4.27232649E-08 | 3.76631543E-02 | *APD | 95 | | | |
| 470- | *APD | 95 | 7.90587857E-09 | -4.1630719E-08 | 1.9636453E-02 | 2.53895349E-09 | *APD | 96 | | | |
| 471- | *APD | 96 | -4.11547134E-08 | 1.09379306E-02 | 8.42714121E-10 | -4.09724133E-08 | *APD | 97 | | | |
| 472- | *APD | 97 | 6.55797428E-03 | 3.08157723E-10 | -4.09230125E-08 | 5.80142066E-03 | *APD | 98 | | | |
| 473- | *APD | 98 | 1.85695431E-10 | | | | *APD | 99 | | | |
| 474- | DMI | *PDU2 | 12 | 1 | 1.84221604E-08 | | *APD | 100 | | | |
| 475- | *APD | 100 | -7.143366772E-09 | 3.34045757E-03 | 3.16485469E-08 | -1.79172055E-08 | *APD | 101 | | | |
| 476- | *APD | 101 | 1.15000042E-02 | 5.05219049E-08 | -3.94915922E-08 | 3.78847681E-02 | *APD | 102 | | | |
| 477- | *APD | 102 | 7.85887462E-08 | -9.35038684E-08 | 1.30522013E-01 | 6.50532002E-08 | *APD | 103 | | | |
| 478- | *APD | 103 | -4.01159426E-08 | 3.79262751E-02 | 6.03777046E-08 | -1.94122869E-08 | *APD | 104 | | | |
| 479- | *APD | 104 | 1.16973972E-02 | 5.91494884E-08 | -1.01057864E-08 | 3.75466119E-03 | *APD | 105 | | | |
| 480- | *APD | 105 | 5.65078119E-08 | -5.53761661E-09 | 1.24622439E-03 | 5.82486415E-08 | *APD | 106 | | | |
| 481- | *APD | 106 | -3.58626950E-09 | 4.55710804E-04 | 5.91784114E-08 | -2.99016034E-09 | *APD | 107 | | | |
| 482- | *APD | 107 | 2.74610473E-04 | | | | *APD | 108 | | | |
| 483- | DMI | *PDU2 | 13 | 1 | 8.23292136E-02 | | *APD | 109 | | | |
| 484- | *APD | 109 | 2.62712541E-09 | -5.00949724E-10 | 1.66302741E-01 | 6.42253184E-09 | *APD | 110 | | | |
| 485- | *APD | 110 | -1.09674430E-09 | 2.55295091E-01 | 1.33506610E-08 | -5.35157141E-09 | *APD | 111 | | | |
| 486- | *APD | 111 | 3.59268665E-01 | 2.81723480E-08 | -1.73743437E-08 | 5.14051616E-01 | *APD | 112 | | | |
| 487- | *APD | 112 | 6.59514967E-08 | -5.98002430E-08 | 4.39378262E-01 | 2.84083725E-08 | *APD | 113 | | | |
| 488- | *APD | 113 | -1.73786283E-08 | 4.15576271E-01 | 1.35147929E-08 | -5.35569189E-09 | *APD | 114 | | | |
| 489- | *APD | 114 | 4.06916142E-01 | 7.53543594E-09 | -1.73905645E-09 | 4.03630495E-01 | *APD | 115 | | | |
| 490- | *APD | 115 | 4.72703121E-09 | -6.26747094E-10 | 4.02764916E-01 | 3.92412502E-09 | *APD | 116 | | | |
| 491- | *APD | 116 | -3.75217413E-10 | | | | *APD | 117 | | | |
| 492- | DMI | *PDU2 | 14 | 1 | -1.04889033E-08 | | *APD | 118 | | | |
| 493- | *APD | 118 | 7.25795074E-03 | 7.39440001E-10 | -2.11813962E-08 | 1.77435428E-02 | *APD | 119 | | | |
| 494- | *APD | 119 | 2.50456411E-09 | -3.25100412E-08 | 3.68938906E-02 | 7.89945886E-09 | *APD | 120 | | | |
| 495- | *APD | 120 | -4.57507888E-08 | 7.76317451E-02 | 2.56462091E-08 | -6.54729320E-08 | *APD | 121 | | | |
| 496- | *APD | 121 | 1.82204306E-01 | 8.82711782E-08 | -5.59620581E-08 | 7.84838200E-02 | *APD | 122 | | | |
| 497- | *APD | 122 | 2.56525929E-08 | -5.29304920E-08 | 5.84424217E-02 | 7.92029905E-09 | *APD | 123 | | | |
| 498- | *APD | 123 | -5.18274774E-08 | 2.08182965E-04 | 2.56702120E-09 | -5.14089962E-08 | *APD | 124 | | | |
| 499- | *APD | 124 | 1.30593614E-02 | 9.25141297E-10 | -5.12987448E-08 | 1.06411408E-02 | *APD | 125 | | | |
| 500- | *APD | 125 | 5.53888515E-10 | | | | *APD | 126 | | | |

AXISYMMETRIC CIRC. CYL. WITH FLUID

HARMONIC REDUCTION

MAY 4. 1974 NASTRAN 5/13/72

SORTED BULK DATA ECHO

| CARD | COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------|-------|-------|-----------------|-----------------|------------------|---|---|---|-----------------|------|-----|
| 501- | DM1 | *PDU2 | 15 | | | | | | | | |
| 502- | *APD | 127 | 3.74088671E-09 | 1.09350914E-03 | 3.01126448E-08 | | | | 1.49074530E-08 | *APD | 127 |
| 503- | *APD | 128 | 3.70380539E-03 | 4.62265994E-08 | -1.901063384E-08 | | | | 1.16818994E-02 | *APD | 129 |
| 504- | *APD | 129 | 6.50E32002E-08 | -4.01159420E-08 | 3.79262753E-02 | | | | 9.39799047E-08 | *APD | 130 |
| 505- | *APD | 130 | -9.39114670E-08 | 1.3C537391E-01 | 7.95587312E-08 | | | | -4.04520293E-08 | *APD | 131 |
| 506- | *APD | 131 | 3.79356258E-02 | 7.52488631E-08 | -1.96139354E-08 | | | | 1.17127188E-02 | *APD | 132 |
| 507- | *APD | 132 | 7.36807806E-08 | -1.07301368E-08 | 3.79616814E-03 | | | | 7.30858574E-08 | *APD | 133 |
| 508- | *APD | 133 | -6.73104594E-05 | 1.36811961E-03 | 7.29290832E-08 | | | | -5.58775071E-09 | *APD | 134 |
| 509- | *APC | 134 | 8.19058390E-04 | | | | | | | | |
| 510- | DM1 | *PDU2 | 16 | | | | | | | | |
| 511- | *APD | 126 | 1.40558765E-09 | -1.66452699E-10 | 1.62839234E-01 | | | | 8.10757279E-02 | *APD | 136 |
| 512- | *APD | 137 | -5.56786839E-10 | 2.46554673E-01 | 6.86099710E-09 | | | | 3.39501316E-09 | *APD | 137 |
| 513- | *APD | 138 | 3.35439668E-01 | 1.36327287E-08 | -5.35864326E-09 | | | | -1.71575905E-09 | *APD | 138 |
| 514- | *APC | 139 | 2.84083725E-08 | -1.73766283E-08 | 5.99192207E-01 | | | | 4.39373628E-01 | *APD | 139 |
| 515- | *APD | 140 | -5.98073484E-08 | 5.19630134E-01 | 2.88468378E-08 | | | | 6.62336534E-08 | *APD | 140 |
| 516- | *APD | 141 | 4.96086359E-01 | 1.46826835E-03 | -5.42153344E-09 | | | | -1.73975424E-08 | *APD | 141 |
| 517- | *APC | 142 | 8.94107188E-09 | -1.90550908E-09 | 4.85959709E-01 | | | | 4.87951869E-01 | *APD | 142 |
| 518- | *APD | 143 | -1.12769238E-09 | | | | | | 7.35415639E-09 | *APD | 143 |
| 519- | DM1 | *PDU2 | 17 | | | | | | | | |
| 520- | *APD | 145 | 3.38321863E-03 | 2.45700793E-10 | -2.07402664E-08 | | | | -1.03263353E-08 | *APD | 145 |
| 521- | *APD | 146 | 8.21873236E-10 | -3.14028021E-08 | 1.89548880E-02 | | | | 9.37940553E-03 | *APD | 146 |
| 522- | *APD | 147 | -4.27232649E-08 | 3.76631543E-02 | 7.90987897E-09 | | | | 2.53262318E-09 | *APD | 147 |
| 523- | *APD | 148 | 7.84839200E-02 | 2.56525929E-08 | -7.56801342E-08 | | | | -5.59620561E-08 | *APD | 148 |
| 524- | *APD | 149 | 8.82815812E-08 | -6.61834179E-08 | 7.96351652E-02 | | | | 1.82983337E-01 | *APD | 149 |
| 525- | *APD | 150 | -6.31847570E-08 | 4.65638605E-02 | 8.00272915E-09 | | | | 2.56800594E-08 | *APD | 150 |
| 526- | *APD | 151 | 2.47015134E-02 | 2.81272183E-09 | -6.18949230E-08 | | | | -6.21537879E-08 | *APD | 151 |
| 527- | *APD | 152 | 1.66458691E-09 | | | | | | 2.03173621E-02 | *APD | 152 |
| 528- | DM1 | *PDU2 | 18 | | | | | | | | |
| 529- | *APD | 154 | -2.00148276E-09 | 3.63347819E-04 | 2.94855056E-08 | | | | 1.46804879E-08 | *APD | 154 |
| 530- | *APD | 155 | 1.21540460E-03 | 4.46439343E-08 | -9.75969972E-09 | | | | -4.83431961E-09 | *APD | 155 |
| 531- | *APD | 156 | 6.07377046E-08 | -1.94122869E-08 | 1.16973072E-02 | | | | 3.74531257E-03 | *APD | 156 |
| 532- | *APD | 157 | -4.04520293E-08 | 3.79356258E-02 | 1.07591063E-07 | | | | 7.95587312E-08 | *APD | 157 |
| 533- | *APD | 158 | 1.30552828E-01 | 9.40900122E-08 | -4.107591063E-07 | | | | -9.43131226E-08 | *APD | 158 |
| 534- | *APD | 159 | 8.98269263E-08 | -2.09073683E-04 | 1.18346140E-02 | | | | 3.79771329E-02 | *APD | 159 |
| 535- | *APD | 160 | -1.27116184E-08 | 4.15551338E-03 | 8.79912713E-08 | | | | 8.83612756E-08 | *APD | 160 |
| 536- | *APD | 161 | 2.40162629E-03 | | | | | | -1.04719327E-08 | *APD | 161 |
| 537- | DM1 | *PDU2 | 19 | | | | | | | | |
| 538- | *APD | 163 | 7.67887575E-10 | -5.58412760E-11 | 1.61327666E-01 | | | | 8.05100203E-02 | *APD | 163 |
| 539- | *APD | 164 | -1.85457489E-10 | 2.42979425E-01 | 3.67707979E-09 | | | | 1.84405159E-09 | *APD | 164 |
| 540- | *APD | 165 | 3.26684299E-01 | 7.05702164E-09 | -1.72004166E-09 | | | | -5.63846301E-10 | *APD | 165 |
| 541- | *APC | 166 | 1.39147929E-08 | -5.36569189E-09 | 5.19610134E-01 | | | | 4.15576279E-01 | *APD | 166 |
| 542- | *APD | 167 | -1.73976424E-08 | 6.74702287E-01 | 6.70014515E-08 | | | | 2.88468178E-08 | *APD | 167 |
| 543- | *APD | 168 | 6.00705922E-01 | 3.02524228E-08 | -1.75640942E-08 | | | | -5.98631846E-08 | *APD | 168 |
| 544- | *APD | 169 | 1.71090051E-08 | -5.92248028E-09 | 5.73213882E-01 | | | | 5.78415573E-01 | *APD | 169 |
| 545- | *APC | 170 | -3.43579964E-05 | | | | | | 1.39580187E-08 | *APD | 170 |
| 546- | DM1 | *PDU2 | 20 | | | | | | | | |
| 547- | *APD | 172 | 2.12144526E-03 | 8.24273011E-11 | -2.05477377E-08 | | | | -1.02542828E-08 | *APD | 172 |
| 548- | *APD | 173 | 2.7376841E-10 | -3.05474899E-08 | 1.081586729E-02 | | | | 5.09456173E-03 | *APD | 173 |
| 549- | *APD | 174 | -4.16060715E-08 | 1.96069553E-02 | 2.53895349E-09 | | | | 8.32293567E-10 | *APD | 174 |
| 550- | *APD | 175 | 3.84424217E-02 | 7.92029504E-09 | -6.61834179E-08 | | | | -5.29304920E-08 | *APD | 175 |
| | | | | | | | | | 7.96351652E-02 | *APD | 176 |

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OF POOR QUALITY

SORTED BULK DATA ECHG

| CARD
COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------------|----------|-----------------|-----------------|------------------|-----------------|----------|---|---|---|----|
| 551- | *APD 176 | 2.56806594E-08 | -8.59334402E-08 | 1.85105085E-01 | 8.83640041E-08 | *APD 177 | | | | |
| 552- | *APC 177 | -7.65097639E-08 | 8.35784027E-08 | 2.59263579E-08 | -7.36707193E-08 | *APD 178 | | | | |
| 553- | *APD 178 | 4.78218235E-02 | 8.74217321E-09 | -7.30088345E-08 | 3.85618359E-02 | *APD 179 | | | | |
| 554- | *APC 179 | 5.07158049E-09 | | | | *APD 180 | | | | |
| 555- | DMI | *PDU2 | 21 | | | | | | | |
| 556- | *APD 181 | -1.09343201E-09 | 1.21895344E-04 | 2.92117974E-08 | -2.62583244E-09 | *APD 181 | | | | |
| 557- | *APD 182 | 4.04855004E-04 | 4.39966570E-08 | -5.23596810E-09 | 1.23021449E-03 | *APD 183 | | | | |
| 558- | *APD 183 | 5.91494889E-08 | -1.01057804E-08 | 3.75466119E-03 | 7.52488631E-03 | *APD 184 | | | | |
| 559- | *APD 184 | -1.98139354E-08 | 1.17127181E-02 | 9.40903122E-08 | -4.10763794E-08 | *APD 185 | | | | |
| 560- | *APC 185 | 3.79771329E-02 | 1.22169124E-07 | -9.540045627E-08 | 1.30674729E-01 | *APD 186 | | | | |
| 561- | *APD 186 | 1.08773507E-07 | -4.30778011E-08 | 3.83404791E-02 | 1.04734397E-07 | *APD 187 | | | | |
| 562- | *APC 187 | -2.46482550E-08 | 1.29281233E-02 | 1.03793411E-07 | -1.98754826E-08 | *APD 188 | | | | |
| 563- | *APD 188 | 7.49597050E-03 | | | | *APD 189 | | | | |
| 564- | DMI | *PDU2 | 22 | | | | | | | |
| 565- | *APD 190 | 4.38464154E-10 | -1.90147897E-11 | 1.60650611E-01 | 1.04995479E-09 | *APD 191 | | | | |
| 566- | *APD 191 | -6.29007124E-11 | 2.41437197E-01 | 2.08007678E-09 | -1.89750160E-10 | *APD 192 | | | | |
| 567- | *APD 192 | 3.23120475E-01 | 3.95914412E-09 | -5.70905767E-10 | 4.06916142E-01 | *APD 193 | | | | |
| 568- | *APD 193 | 7.53543690E-09 | -1.73905644E-09 | 4.96086359E-01 | 1.46826835E-08 | *APD 194 | | | | |
| 569- | *APD 194 | -5.42153344E-09 | 6.00705922E-01 | 3.02524228E-08 | -1.75640942E-08 | *APD 195 | | | | |
| 570- | *APD 195 | 7.57031500E-01 | 6.96285833E-08 | -6.03641297E-08 | 6.85932334E-01 | *APD 196 | | | | |
| 571- | *APD 196 | 3.52693656E-08 | -1.90543833E-08 | 6.70871437E-01 | 2.72654503E-08 | *APD 197 | | | | |
| 572- | *APD 197 | -1.07172653E-08 | | | | *APD 198 | | | | |
| 573- | DMI | *PDU2 | 23 | | | | | | | |
| 574- | *APD 199 | 1.21134543E-03 | 2.80677424E-11 | -2.04615063E-08 | 2.90071149E-03 | *APD 200 | | | | |
| 575- | *APD 200 | 5.28477434E-11 | -3.07510101E-08 | 5.74662909E-03 | 2.80090173E-10 | *APD 201 | | | | |
| 576- | *APD 201 | -4.11547134E-08 | 1.09379368E-02 | 8.42714121E-10 | -5.18274774E-08 | *APD 202 | | | | |
| 577- | *APD 202 | 2.08182968E-02 | 2.56702126E-09 | -6.31847570E-08 | 4.05638665E-02 | *APD 203 | | | | |
| 578- | *APD 203 | 8.00272915E-09 | -7.65097639E-08 | 8.35784027E-08 | 2.59263579E-08 | *APD 204 | | | | |
| 579- | *APD 204 | -9.64204219E-08 | 1.922353024E-01 | 8.91034801E-08 | -8.73648105E-08 | *APD 205 | | | | |
| 580- | *APD 205 | 9.74386930E-02 | 2.81852194E-08 | -4.54465156E-08 | 7.53262639E-02 | *APD 206 | | | | |
| 581- | *APD 206 | 1.58197579E-08 | | | | *APD 207 | | | | |
| 582- | DMI | *PDU2 | 24 | | | | | | | |
| 583- | *APD 208 | -6.24345950E-10 | 4.15071991E-05 | 2.90892075E-08 | -1.45313130E-08 | *APD 208 | | | | |
| 584- | *APD 209 | 1.37305324E-04 | 4.37173320E-08 | -2.96191982E-09 | 4.14203620E-04 | *APD 209 | | | | |
| 585- | *APD 210 | 5.85078119E-08 | -5.63761006E-09 | 1.24622439E-03 | 7.36807806E-08 | *APD 211 | | | | |
| 586- | *APD 211 | -1.07301368E-08 | 3.79616814E-03 | 8.98269263E-08 | -2.09073087E-08 | *APD 212 | | | | |
| 587- | *APD 212 | 1.18340140E-02 | 1.08770507E-07 | -4.30778613E-08 | 3.83404791E-02 | *APD 213 | | | | |
| 588- | *APD 213 | 1.37076597E-07 | -9.91474845E-08 | 1.31768227E-01 | 1.24202700E-07 | *APD 214 | | | | |
| 589- | *APD 214 | -5.02217254E-08 | 4.16809332E-02 | 1.21475466E-07 | -3.88245566E-08 | *APD 215 | | | | |
| 590- | *APD 215 | 2.33946107E-02 | | | | *APD 216 | | | | |
| 591- | DMI | *PDU2 | 25 | | | | | | | |
| 592- | *APD 217 | 2.82000814E-10 | -7.05944764E-12 | 1.60361469E-01 | 6.74489353E-10 | *APD 218 | | | | |
| 593- | *APD 218 | -2.32974612E-11 | 2.40791202E-01 | 1.33202160E-09 | -6.99601627E-11 | *APD 219 | | | | |
| 594- | *APD 219 | 3.21689129E-01 | 2.51854071E-09 | -2.08764936E-10 | 4.03630495E-01 | *APD 220 | | | | |
| 595- | *APD 220 | 4.72703121E-09 | -6.26747095E-10 | 4.87991869E-01 | 8.94107188E-09 | *APD 221 | | | | |
| 596- | *APD 221 | -1.9050908E-09 | 5.78415573E-01 | 1.73998051E-08 | -5.92248028E-09 | *APD 222 | | | | |
| 597- | *APD 222 | 6.85932934E-01 | 3.52693090E-08 | -1.90943830E-08 | 8.49487364E-01 | *APD 223 | | | | |
| 598- | *APD 223 | 7.55842539E-09 | -6.51508721E-08 | 7.98046927E-01 | 5.65807099E-08 | *APD 224 | | | | |
| 599- | *APD 224 | -3.47529614E-08 | | | | *APD 225 | | | | |
| 600- | DMI | *PDU2 | 26 | | | | | | | |
| | | | | | | | | | | |

AXISYMMETRIC CIRC. CYL. WITH FLUID

HARMONIC REDUCTION

MAY 4, 1974

NASTRAN 5/13/72

SORTED BULK DATA ECTO

| CARD | COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------|----------|-----------------|-----------------|-----------------|-----------------|----------|----|---|---|---|----|
| 601- | *APD 226 | 7.79266469E-04 | 1.04204301E-11 | -2.04246753E-08 | 1.86341233E-03 | *APD 227 | | | | | |
| 602- | *APD 227 | 3.43893941E-11 | -3.06687258E-08 | 3.67997750E-03 | 1.03268186E-10 | *APD 228 | | | | | |
| 603- | *APD 228 | -4.09724130E-08 | 6.95797428E-03 | 3.08157722E-10 | -5.14089962E-08 | *APD 229 | | | | | |
| 604- | *APD 229 | 1.30593814E-02 | 9.25141297E-10 | -6.21537879E-08 | 2.47015134E-02 | *APD 230 | | | | | |
| 605- | *APD 230 | 2.81272103E-09 | -7.36707153E-08 | 4.78218235E-02 | 8.74017321E-09 | *APD 231 | | | | | |
| 606- | *APD 231 | -8.73648105E-08 | 9.74386930E-02 | 2.81852195E-08 | -1.08196161E-07 | *APD 232 | | | | | |
| 607- | *APD 232 | 2.15867527E-01 | 9.61810542E-08 | -1.01720843E-07 | 1.56315565E-01 | *APD 233 | | | | | |
| 608- | *APD 233 | 5.12988443E-08 | | | | *APD 234 | | | | | |
| 609- | DMI | *PDU2 | | | | | | | | | |
| 610- | *APD 235 | -4.01648270E-10 | 1.54098335E-05 | 2.90368476E-08 | -9.63437285E-10 | *APD 236 | | | | | |
| 611- | *APD 236 | 5.08558005E-05 | 4.36003587E-08 | -1.89672855E-09 | 1.52715307E-04 | *APD 237 | | | | | |
| 612- | *APD 237 | 5.82486415E-08 | -3.58626950E-09 | 4.55710804E-04 | 7.30858574E-08 | *APD 238 | | | | | |
| 613- | *APD 238 | -6.73104594E-09 | 1.36811961E-03 | 8.83612756E-08 | -1.27316184E-08 | *APD 239 | | | | | |
| 614- | *APD 239 | 4.15951386E-03 | 1.04734357E-07 | -2.46482550E-08 | 1.29281208E-02 | *APD 240 | | | | | |
| 615- | *APD 240 | -1.24202700E-07 | -5.02217254E-08 | 4.16809320E-02 | 1.53817666E-07 | *APD 241 | | | | | |
| 616- | *APD 241 | -1.11323779E-07 | 1.42234683E-01 | 1.44611931E-07 | -8.05679292E-08 | *APD 242 | | | | | |
| 617- | *APD 242 | 7.58618712E-02 | | | | *APD 243 | | | | | |
| 618- | DMI | *PDU2 | | | | | | | | | |
| 619- | *APD 244 | 1.33540595E-10 | -2.02863334E-12 | 8.01405907E-02 | 3.19180682E-10 | *APD 245 | | | | | |
| 620- | *APD 245 | -6.68789503E-12 | 1.20306730E-01 | 9.29697183E-10 | -2.00426481E-11 | *APD 246 | | | | | |
| 621- | *APD 246 | 1.60650671E-01 | 1.18810650E-09 | -5.95901245E-11 | 2.01382458E-01 | *APD 247 | | | | | |
| 622- | *APD 247 | 2.22023022E-09 | -1.77734605E-10 | 2.42975894E-01 | 4.16390273E-09 | *APD 248 | | | | | |
| 623- | *APD 248 | -5.34170042E-10 | 2.86609471E-01 | 7.89725881E-09 | -1.62748393E-09 | *APD 249 | | | | | |
| 624- | *APD 249 | 3.35435748E-01 | 1.54265045E-08 | -5.07660047E-09 | 3.99323523E-01 | *APD 250 | | | | | |
| 625- | *APD 250 | 3.20127711E-08 | -1.64619287E-08 | 5.14051735E-01 | 7.46293267E-08 | *APD 251 | | | | | |
| 626- | *APD 251 | -5.66529046E-08 | | | | *APD 252 | | | | | |
| 627- | DMI | *PDU2 | | | | | | | | | |
| 628- | *APD 253 | 3.26033449E-04 | 3.06413835E-12 | -1.37626941E-08 | 7.79266469E-04 | *APD 254 | | | | | |
| 629- | *APD 254 | 1.01016938E-11 | -2.06604973E-08 | 1.53737888E-03 | 3.02732978E-11 | *APD 255 | | | | | |
| 630- | *APD 255 | -2.75688361E-08 | 2.90071149E-03 | 9.00075847E-11 | -3.45837883E-08 | *APD 256 | | | | | |
| 631- | *APD 256 | 5.42059541E-03 | 2.68458145E-10 | -4.17273895E-08 | 1.01586729E-02 | *APD 257 | | | | | |
| 632- | *APD 257 | 8.06834155E-10 | -4.92199810E-08 | 1.92809217E-02 | 2.45822407E-09 | *APD 258 | | | | | |
| 633- | *APD 258 | -5.76050070E-08 | 3.76631586E-02 | 7.66792141E-09 | -6.85765258E-08 | *APD 259 | | | | | |
| 634- | *APD 259 | 7.81577826E-02 | 2.46643284E-08 | -8.82790232E-08 | 1.82204425E-01 | *APD 260 | | | | | |
| 635- | *APD 260 | 8.55710556E-08 | | | | *APD 261 | | | | | |
| 636- | DMI | *PDU2 | | | | | | | | | |
| 637- | *APD 262 | -1.56397770E-10 | 4.67430073E-06 | 1.509344434E-08 | -3.73812759E-10 | *APD 263 | | | | | |
| 638- | *APD 263 | 1.54099835E-05 | 2.26657125E-08 | -7.37477857E-10 | 4.61814925E-05 | *APD 264 | | | | | |
| 639- | *APD 264 | 3.02664800E-08 | -1.39146605E-09 | 1.37305309E-04 | 3.79400338E-08 | *APD 265 | | | | | |
| 640- | *APD 265 | -2.60025090E-09 | 4.0529074E-04 | 4.5772664E-08 | -4.87309746E-09 | *APD 266 | | | | | |
| 641- | *APD 266 | 1.23081426E-03 | 5.39370593E-08 | -9.24902110E-09 | 3.74998641E-03 | *APD 267 | | | | | |
| 642- | *APD 267 | 6.31350983E-08 | -1.80669488E-08 | 1.16973072E-02 | 7.52325649E-08 | *APD 268 | | | | | |
| 643- | *APD 268 | -3.74921640E-08 | 3.79303946E-02 | 9.68479317E-08 | -8.74031230E-08 | *APD 269 | | | | | |
| 644- | *APD 269 | 1.30537450E-01 | | | | *APD 270 | | | | | |
| 645- | DMI | TU12 | 0 | 1 | 2 | 15 | 30 | | | | |
| 646- | *TU12 | | | | | | | | | | |
| 647- | *ATU 1 | -0.53458869E-08 | -7.94370294E-08 | -1.74978077E-01 | 4.96155472E-08 | *ATU 2 | | | | | |
| 648- | *ATU 2 | -8.09579319E-08 | -2.44192878E-01 | 6.51131700E-08 | -1.07940593E-07 | *ATU 3 | | | | | |
| 649- | *ATU 3 | -4.15904641E-01 | 6.76216132E-08 | -1.56354929E-07 | -8.77412558E-01 | *ATU 4 | | | | | |
| 650- | *ATU 4 | 7.80204346E-08 | -2.36557333E-07 | | | *ATU 5 | | | | | |

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SORTED BULK DATA ECHO

| CARD | COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------|-------|-------|-----------------|-----------------|-----------------|------------------|----------------|---|---|---|----|
| 651- | DMI | *TU12 | 2 | | | | | | | | |
| 652- | *ATU | 6 | 9.58415912E-04 | 1.18971765E-09 | 2.65904170E-08 | -2.656741680E-02 | 2.18358203E-08 | | | | |
| 653- | *ATU | 7 | 1.93318144E-08 | 4.79086333E-08 | -8.57254267E-02 | 4.63720617E-08 | | | | | |
| 654- | *ATU | 8 | 9.81684130E-08 | -2.42767751E-01 | 8.17950649E-08 | 2.42849524E-07 | | | | | |
| 655- | *ATU | 9 | -6.98323548E-01 | 1.13016939E-07 | | | | | | | |
| 656- | DMI | *TU12 | 3 | | | | | | | | |
| 657- | *ATU | 11 | -2.66084488E-05 | 2.85030299E-03 | -3.14193720E-08 | 1.23995019E-08 | | | | | |
| 658- | *ATU | 12 | 1.16847618E-03 | -4.92969683E-08 | 5.92054654E-08 | -2.14229114E-02 | | | | | |
| 659- | *ATU | 13 | -1.06516609E-07 | 2.08539859E-07 | -1.23851180E-01 | -3.09364793E-07 | | | | | |
| 660- | *ATU | 14 | 7.34759794E-07 | -5.48023920E-01 | | | | | | | |
| 661- | DMI | *TU12 | 4 | | | | | | | | |
| 662- | *ATU | 16 | -1.14026705E-07 | -1.36750229E-07 | -2.85390079E-01 | 8.58086651E-08 | | | | | |
| 663- | *ATU | 17 | -1.31515037E-07 | -3.45734299E-01 | 1.06588800E-07 | -1.00320951E-07 | | | | | |
| 664- | *ATU | 18 | -4.45234716E-01 | 1.03763909E-07 | -1.99007843E-07 | -5.53683519E-01 | | | | | |
| 665- | *ATU | 19 | 1.06212781E-07 | -2.37836449E-07 | | | | | | | |
| 666- | DMI | *TU12 | 5 | | | | | | | | |
| 667- | *ATU | 21 | 1.08317728E-03 | 1.55774333E-10 | 4.11064143E-08 | -2.81775739E-02 | | | | | |
| 668- | *ATU | 22 | 2.10037285E-08 | 6.00306066E-08 | -8.15093412E-02 | 4.84767457E-08 | | | | | |
| 669- | *ATU | 23 | 8.89549483E-08 | -1.73212349E-01 | 7.51426796E-08 | 1.23696509E-07 | | | | | |
| 670- | *ATU | 24 | -2.84256173E-01 | 9.08859769E-08 | | | | | | | |
| 671- | DMI | *TU12 | 6 | | | | | | | | |
| 672- | *ATU | 26 | -1.67522130E-09 | 1.46920099E-03 | -5.15055625E-08 | -1.40847373E-08 | | | | | |
| 673- | *ATU | 27 | 7.53710745E-04 | -6.59152309E-08 | 5.18466940E-08 | -1.30681995E-02 | | | | | |
| 674- | *ATU | 28 | 9.86321068E-08 | 1.32075919E-07 | -6.35476497E-02 | -1.43006673E-07 | | | | | |
| 675- | *ATU | 29 | 2.52497533E-07 | -1.55679466E-01 | | | | | | | |
| 676- | DMI | *TU12 | 7 | | | | | | | | |
| 677- | *ATU | 31 | -1.44523312E-07 | -1.72530179E-07 | -3.44076931E-01 | 1.08084919E-07 | | | | | |
| 678- | *ATU | 32 | -1.58305227E-07 | -3.81478602E-01 | 1.25972845E-07 | -1.81004680E-07 | | | | | |
| 679- | *ATU | 33 | -4.28459937E-01 | 1.23733969E-07 | -2.07947210E-07 | -4.54169691E-01 | | | | | |
| 680- | *ATU | 34 | 1.234443726E-07 | -2.31439021E-07 | | | | | | | |
| 681- | DMI | *TU12 | 8 | | | | | | | | |
| 682- | *ATU | 36 | 8.29251250E-04 | -2.16874449E-10 | 4.74146873E-08 | -2.14195214E-02 | | | | | |
| 683- | *ATU | 37 | 1.57082845E-08 | 5.95369909E-08 | -5.58494627E-02 | 3.53916238E-08 | | | | | |
| 684- | *ATU | 38 | 7.33342631E-08 | -1.00755019E-01 | 5.15858538E-08 | 8.26270252E-08 | | | | | |
| 685- | *ATU | 39 | -1.32003367E-01 | 5.94559364E-08 | | | | | | | |
| 686- | DMI | *TU12 | 9 | | | | | | | | |
| 687- | *ATU | 41 | -9.01174912E-10 | 6.23100973E-04 | -6.22223979E-08 | 1.07876552E-08 | | | | | |
| 688- | *ATU | 42 | 3.53835989E-04 | -7.06029369E-08 | 3.33038943E-08 | -6.44360483E-03 | | | | | |
| 689- | *ATU | 43 | -8.39695808E-08 | 6.85827399E-08 | -2.53177881E-02 | -9.52150572E-08 | | | | | |
| 690- | *ATU | 44 | 1.00361660E-07 | -4.72604070E-02 | | | | | | | |
| 691- | DMI | *TU12 | 10 | | | | | | | | |
| 692- | *ATU | 46 | -1.61784556E-07 | -1.92759029E-07 | -3.73153249E-01 | 1.2663087E-07 | | | | | |
| 693- | *ATU | 47 | -1.71572879E-07 | -3.93532634E-01 | 1.42645740E-07 | -1.80587137E-07 | | | | | |
| 694- | *ATU | 48 | -4.14900691E-01 | 1.34973220E-07 | -2.08345057E-07 | -4.16659508E-01 | | | | | |
| 695- | *ATU | 49 | 1.33787410E-07 | -2.26890222E-07 | | | | | | | |
| 696- | DMI | *TU12 | 11 | | | | | | | | |
| 697- | *ATU | 51 | 5.19060503E-04 | -2.54403544E-10 | 4.98411303E-08 | -1.35026811E-03 | | | | | |
| 698- | *ATU | 52 | 1.00651743E-03 | 5.87543319E-03 | -3.38273738E-02 | 2.22703243E-08 | | | | | |
| 699- | *ATU | 53 | 6.42662902E-08 | -5.56540000E-02 | 3.17056461E-08 | 6.57962005E-08 | | | | | |
| 700- | *ATU | 54 | -6.04411783E-02 | 3.58671350E-04 | | | | | | | |

SORTED BULK DATA ECHO

| CARD | COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
|------|-------|-------|-----------------|-----------------|-----------------|-----------------|------|-----|-----------------|-----------------|------|-----|
| 701- | DMI | *TU12 | 12 | | | | | | | | | |
| 702- | *ATU | 56 | -4.58221239E-10 | 2.37231143E-04 | -6.75348133E-08 | 7.01167835E-09 | *ATU | 56 | -7.58429906E-08 | *ATU | 56 | |
| 703- | *ATU | 57 | 1.43702666E-04 | -7.18693514E-08 | 1.92447764E-08 | -2.58036540E-03 | *ATU | 58 | 1.92447764E-08 | -2.58036540E-03 | *ATU | 58 |
| 704- | *ATU | 58 | -7.74575142E-08 | 3.49179459E-08 | -9.24633046E-03 | -7.99266736E-08 | *ATU | 59 | -7.99266736E-08 | *ATU | 59 | |
| 705- | *ATU | 59 | 4.45056507E-08 | -1.50015875E-02 | | | *ATU | 60 | | | *ATU | 60 |
| 706- | DMI | *TU12 | 13 | | | | | | | | | |
| 707- | *ATU | 61 | -1.70973915E-07 | -2.03524903E-07 | -3.87164593E-01 | 1.27367002E-07 | *ATU | 62 | -4.42730427E-01 | *ATU | 61 | |
| 708- | *ATU | 62 | -1.77971685E-07 | -3.97632957E-01 | 1.49531672E-07 | -1.91305958E-07 | *ATU | 63 | 1.27367002E-07 | -1.91305958E-07 | *ATU | 62 |
| 709- | *ATU | 63 | -4.07383442E-01 | 1.41330304E-07 | -2.07236837E-07 | -4.04424787E-01 | *ATU | 64 | -4.04424787E-01 | *ATU | 63 | |
| 710- | *ATU | 64 | 1.39883696E-07 | -2.23572044E-07 | | | *ATU | 65 | | | *ATU | 64 |
| 711- | DMI | *TU12 | 14 | | | | | | | | | |
| 712- | *ATU | 66 | 3.22924461E-04 | -1.90480770E-10 | 5.06905877E-08 | -8.22463259E-03 | *ATU | 67 | 5.64511602E-08 | *ATU | 66 | |
| 713- | *ATU | 67 | 5.37038206E-09 | 5.44489751E-08 | -1.94023177E-02 | 1.31239291E-08 | *ATU | 68 | -8.22463259E-03 | *ATU | 67 | |
| 714- | *ATU | 68 | 5.75337751E-08 | -3.03312577E-02 | 1.84845490E-08 | 5.80380615E-08 | *ATU | 69 | 1.31239291E-08 | -1.94023177E-02 | *ATU | 68 |
| 715- | *ATU | 69 | -3.47727127E-02 | 2.67705320E-08 | | | *ATU | 70 | 5.80380615E-08 | *ATU | 69 | |
| 716- | DMI | *TU12 | 15 | | | | | | | | | |
| 717- | *ATU | 71 | -2.31736577E-10 | 8.58500202E-05 | -7.00920850E-08 | 4.20054391E-09 | *ATU | 72 | -8.01463216E-08 | *ATU | 71 | |
| 718- | *ATU | 72 | 5.41246263E-05 | -7.22279193E-08 | 1.06746150E-08 | -9.61648067E-04 | *ATU | 73 | 4.20054391E-09 | -7.00920850E-08 | *ATU | 72 |
| 719- | *ATU | 73 | -7.45646478E-08 | 1.76230337E-08 | -3.25128413E-03 | -7.45738475E-08 | *ATU | 74 | -9.61648067E-04 | -9.61648067E-04 | *ATU | 73 |
| 720- | *ATU | 74 | 2.12705373E-08 | -4.89497932E-03 | | | *ATU | 75 | -7.45738475E-08 | *ATU | 74 | |
| 721- | DMI | *TU12 | 16 | | | | | | | | | |
| 722- | *ATU | 76 | -1.75682089E-07 | -2.09040024E-07 | -3.93851578E-01 | 1.30688793E-07 | *ATU | 77 | -4.54785228E-01 | *ATU | 76 | |
| 723- | *ATU | 77 | -1.81029293E-07 | -3.99081230E-01 | 1.53190342E-07 | -1.92287075E-07 | *ATU | 78 | 1.30688793E-07 | -1.92287075E-07 | *ATU | 77 |
| 724- | *ATU | 78 | -4.03555584E-01 | 1.44913594E-07 | -2.06271409E-07 | -3.98267329E-01 | *ATU | 79 | -1.92287075E-07 | -1.92287075E-07 | *ATU | 78 |
| 725- | *ATU | 79 | 1.43416401E-07 | -2.21632714E-07 | | | *ATU | 80 | -3.98267329E-01 | *ATU | 79 | |
| 726- | DMI | *TU12 | 17 | | | | | | | | | |
| 727- | *ATU | 81 | 1.85694924E-04 | -1.22482621E-10 | 5.09538847E-08 | -4.71456721E-03 | *ATU | 82 | 5.79601291E-08 | *ATU | 81 | |
| 728- | *ATU | 82 | 3.41804873E-09 | 5.29608224E-03 | -1.08698085E-02 | 7.48385176E-09 | *ATU | 83 | -4.71456721E-03 | *ATU | 82 | |
| 729- | *ATU | 83 | 5.44800542E-08 | -1.65195614E-02 | 1.05055804E-08 | 5.42176330E-08 | *ATU | 84 | -1.08698085E-02 | -1.08698085E-02 | *ATU | 83 |
| 730- | *ATU | 84 | -1.85996480E-02 | 1.17827029E-03 | | | *ATU | 85 | 5.42176330E-08 | *ATU | 84 | |
| 731- | DMI | *TU12 | 18 | | | | | | | | | |
| 732- | *ATU | 86 | -1.18702201E-10 | 3.02016124E-05 | -7.13107511E-08 | 2.41607068E-09 | *ATU | 87 | -8.23416713E-08 | *ATU | 86 | |
| 733- | *ATU | 87 | 1.95277244E-05 | -7.23437665E-08 | 5.84402926E-09 | -3.44428699E-04 | *ATU | 88 | 2.41607068E-09 | -8.23416713E-08 | *ATU | 87 |
| 734- | *ATU | 88 | -7.33625143E-08 | 9.27009978E-09 | -1.12278201E-03 | -7.25605573E-08 | *ATU | 89 | -3.44428699E-04 | -3.44428699E-04 | *ATU | 88 |
| 735- | *ATU | 89 | 1.06570397E-08 | -1.62348244E-03 | | | *ATU | 90 | -1.12278201E-03 | -1.12278201E-03 | *ATU | 89 |
| 736- | DMI | *TU12 | 19 | | | | | | | | | |
| 737- | *ATU | 91 | -1.78030291E-07 | -2.11709250E-07 | -3.97028327E-01 | 1.22697153E-07 | *ATU | 92 | -4.60786581E-01 | *ATU | 91 | |
| 738- | *ATU | 92 | -1.82483575E-07 | -3.99620175E-01 | 1.55135865E-07 | -1.92649452E-07 | *ATU | 93 | 1.22697153E-07 | -1.92649452E-07 | *ATU | 92 |
| 739- | *ATU | 93 | -4.01753068E-01 | 1.46910224E-07 | -2.05665344E-07 | -3.95488381E-01 | *ATU | 94 | -1.92649452E-07 | -1.92649452E-07 | *ATU | 93 |
| 740- | *ATU | 94 | 1.45423558E-07 | -2.20575544E-07 | | | *ATU | 95 | -3.95488381E-01 | *ATU | 94 | |
| 741- | DMI | *TU12 | 20 | | | | | | | | | |
| 742- | *ATU | 96 | 1.05495579E-04 | -7.40651180E-11 | 5.10162828E-08 | -2.67342920E-03 | *ATU | 97 | 5.87090625E-08 | *ATU | 96 | |
| 743- | *ATU | 97 | 1.93540139E-09 | 5.20904171E-08 | -6.08104095E-03 | 4.23547415E-09 | *ATU | 98 | -2.67342920E-03 | -2.67342920E-03 | *ATU | 97 |
| 744- | *ATU | 98 | 5.28640278E-08 | -9.10003870E-03 | 5.94527444E-09 | 5.22793044E-08 | *ATU | 99 | 4.23547415E-09 | -6.08104095E-03 | *ATU | 98 |
| 745- | *ATU | 99 | -1.01599619E-02 | 6.66802068E-09 | | | *ATU | 100 | 5.22793044E-08 | 5.22793044E-08 | *ATU | 99 |
| 746- | DMI | *TU12 | 21 | | | | | | | | | |
| 747- | *ATU | 101 | -6.23653906E-11 | 1.04690689E-05 | -7.18888487E-08 | 1.37305389E-09 | *ATU | 102 | -8.34327807E-08 | *ATU | 101 | |
| 748- | *ATU | 102 | 8.87701959E-06 | -7.23843314E-08 | 3.21894400E-09 | -1.20705357E-04 | *ATU | 103 | 1.37305389E-09 | -7.18888487E-08 | *ATU | 102 |
| 749- | *ATU | 103 | -7.28442794E-08 | 4.94939911E-09 | -3.84650426E-04 | -7.17609510E-08 | *ATU | 104 | -1.20705357E-04 | -1.20705357E-04 | *ATU | 103 |
| 750- | *ATU | 104 | 5.60678988E-09 | -5.44070287E-04 | | | *ATU | 105 | -7.17609510E-08 | -7.17609510E-08 | *ATU | 104 |

ORIGINAL PAGE IS
OF POOR QUALITY.

SORTED BULK DATA ECHO

| CARD | COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------|-------|-------|-----------------|-----------------|-----------------|-----------------|----------|---|---|-----|----|
| 751- | DMI | *TU12 | 22 | | | | | | | | |
| 752- | *ATU | 106 | -1.79166364E-07 | -2.13118369E-07 | -3.98516715E-01 | -4.63685215E-01 | *ATU 106 | | | | |
| 753- | *ATU | 107 | -1.83165639E-07 | -3.99830520E-01 | 1.56147109E-07 | -1.92786999E-07 | *ATU 107 | | | | |
| 754- | *ATU | 108 | -4.00879323E-01 | 1.47588999E-07 | -2.05333315E-07 | -3.94220412E-01 | *ATU 109 | | | | |
| 755- | *ATU | 109 | 1.46523334E-07 | -2.20032007E-07 | | | *ATU 110 | | | | |
| 756- | DMI | *TU12 | 23 | | | | | | | | |
| 757- | *ATU | 111 | 6.15481113E-05 | -4.48905490E-11 | 5.10186656E-08 | -1.55803584E-03 | *ATU 112 | | | | |
| 758- | *ATU | 112 | 1.12685350E-09 | 5.16143395E-08 | -3.51606798E-03 | 2.46764764E-09 | *ATU 113 | | | | |
| 759- | *ATU | 113 | 5.20298649E-08 | -5.21713803E-03 | 3.46802831E-09 | 5.12994944E-08 | *ATU 114 | | | | |
| 760- | *ATU | 114 | -5.80092256E-03 | 3.89208665E-09 | | | *ATU 115 | | | | |
| 761- | DMI | *TU12 | 24 | | | | | | | | |
| 762- | *ATU | 116 | -3.45174167E-11 | 3.63309027E-06 | -7.21593096E-08 | 8.01345656E-10 | *ATU 117 | | | | |
| 763- | *ATU | 117 | 2.41035506E-06 | -7.24077722E-08 | 1.84184401E-09 | -4.21711593E-05 | *ATU 118 | | | | |
| 764- | *ATU | 118 | -7.26210487E-08 | 2.77827938E-09 | -1.32504298E-04 | -7.14327939E-08 | *ATU 119 | | | | |
| 765- | *ATU | 119 | 3.11660941E-09 | -1.85157551E-04 | | | *ATU 120 | | | | |
| 766- | DMI | *TU12 | 25 | | | | | | | | |
| 767- | *ATU | 121 | -1.79672725E-07 | -2.13710337E-07 | -3.99167240E-01 | -1.34018137E-07 | *ATU 122 | | | | |
| 768- | *ATU | 122 | -1.83463897E-07 | -3.99911940E-01 | 1.56627777E-07 | -1.92838172E-07 | *ATU 123 | | | | |
| 769- | *ATU | 123 | -4.00495172E-01 | 1.48516563E-07 | -2.05174331E-07 | -3.93673599E-01 | *ATU 124 | | | | |
| 770- | *ATU | 124 | 1.47066203E-07 | -2.19779955E-07 | | | *ATU 125 | | | | |
| 771- | DMI | *TU12 | 26 | | | | | | | | |
| 772- | *ATU | 126 | 4.00548161E-05 | -2.58809449E-11 | 5.10104030E-08 | -1.01333461E-03 | *ATU 127 | | | | |
| 773- | *ATU | 127 | 7.32460981E-10 | 5.13817362E-08 | -2.27672490E-03 | 1.60557057E-09 | *ATU 128 | | | | |
| 774- | *ATU | 128 | 5.16357268E-08 | -3.36289173E-03 | 2.25971553E-09 | 5.08413756E-08 | *ATU 129 | | | | |
| 775- | *ATU | 129 | -3.73170857E-03 | 2.53781707E-09 | | | *ATU 130 | | | | |
| 776- | DMI | *TU12 | 27 | | | | | | | | |
| 777- | *ATU | 131 | -2.17147272E-11 | 1.36434301E-06 | -7.22774871E-08 | 5.21665922E-10 | *ATU 132 | | | | |
| 778- | *ATU | 132 | 9.11016571E-07 | -7.24162987E-08 | 1.18468660E-09 | -1.59047486E-05 | *ATU 133 | | | | |
| 779- | *ATU | 133 | -7.25306104E-08 | 1.76667725E-09 | -4.95233689E-05 | -7.13017659E-08 | *ATU 134 | | | | |
| 780- | *ATU | 134 | 1.97041963E-09 | -6.87181455E-05 | | | *ATU 135 | | | | |
| 781- | DMI | *TU12 | 28 | | | | | | | | |
| 782- | *ATU | 136 | -8.99072461E-08 | -1.06538895E-07 | -1.99674845E-01 | 6.70488589E-08 | *ATU 137 | | | | |
| 783- | *ATU | 137 | -9.17738134E-08 | -1.99966721E-01 | 7.83391556E-08 | -9.64259220E-08 | *ATU 138 | | | | |
| 784- | *ATU | 138 | -2.00193584E-01 | 7.42700761E-08 | -1.02364343E-07 | -1.95760555E-01 | *ATU 139 | | | | |
| 785- | *ATU | 139 | 7.35402337E-08 | -1.05854112E-07 | | | *ATU 140 | | | | |
| 786- | DMI | *TU12 | 29 | | | | | | | | |
| 787- | *ATU | 141 | 1.68243278E-05 | -1.26568722E-11 | 3.43618716E-08 | -4.25543403E-04 | *ATU 142 | | | | |
| 788- | *ATU | 142 | 3.07522230E-10 | 3.45278182E-08 | -9.54627758E-04 | 6.74544198E-10 | *ATU 143 | | | | |
| 789- | *ATU | 143 | 3.46417295E-08 | -1.40786918E-03 | 9.50190371E-10 | 3.40831612E-08 | *ATU 144 | | | | |
| 790- | *ATU | 144 | -1.56127731E-03 | 1.66756102E-09 | | | *ATU 145 | | | | |
| 791- | DMI | *TU12 | 30 | | | | | | | | |
| 792- | *ATU | 146 | -8.40378114E-12 | 4.15964212E-07 | -3.76185589E-08 | 2.03946401E-10 | *ATU 147 | | | | |
| 793- | *ATU | 147 | 2.78612731E-07 | -3.76747705E-08 | 4.61354954E-10 | -4.85905184E-06 | *ATU 148 | | | | |
| 794- | *ATU | 148 | -3.77201523E-08 | 6.85522750E-10 | -1.50657806E-05 | -3.70752993E-08 | *ATU 149 | | | | |
| 795- | *ATU | 149 | 7.63210606E-10 | -2.08410784E-05 | | | *ATU 150 | | | | |
| 796- | EIGR | 1 | GIV | 0.0 | 10.24 | 25 | 0 | 0 | 0 | EIG | |
| 797- | EIGR | MAX | | | | | | | | | |
| 798- | GRID | 2 | 1 | 1.0000 | 0.000 | 1.0000 | 1 | | | | |
| 799- | GRID | 3 | 1 | 1.0000 | 9.0000 | 1.0000 | 1 | | | | |
| 800- | GRID | 4 | 1 | 1.0000 | 18.0000 | 1.0000 | 1 | | | | |

MAY 4. 1974 NASTRAN 5/13/72

AXISYMMETRIC CIRC. CYL. WITH FLUID
HARMONIC REDUCTION

| S O R T E D B U L K D A T A E C H O | | | | | | | | | | |
|-------------------------------------|----|---|--------|---------|---------|---|---|---|---|----|
| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 801- GRID | 5 | 1 | 1.0000 | 27.0000 | 1.0000 | 1 | | | | |
| 802- GRID | 6 | 1 | 1.0000 | 36.0000 | 1.0000 | 1 | | | | |
| 803- GRID | 7 | 1 | 1.0000 | 45.0000 | 1.0000 | 1 | | | | |
| 804- GRID | 8 | 1 | 1.0000 | 54.0000 | 1.0000 | 1 | | | | |
| 805- GRID | 9 | 1 | 1.0000 | 63.0000 | 1.0000 | 1 | | | | |
| 806- GRID | 10 | 1 | 1.0000 | 72.0000 | 1.0000 | 1 | | | | |
| 807- GRID | 11 | 1 | 1.0000 | 81.0000 | 1.0000 | 1 | | | | |
| 808- GRID | 12 | 1 | 1.0000 | 90.0000 | 1.0000 | 1 | | | | |
| 809- GRID | 13 | 1 | 1.0000 | 00.0000 | 00.0000 | 1 | | | | |
| 810- GRID | 14 | 1 | 1.0000 | 9.0000 | 00.0000 | 1 | | | | |
| 811- GRID | 15 | 1 | 1.0000 | 18.0000 | 00.0000 | 1 | | | | |
| 812- GRID | 16 | 1 | 1.0000 | 27.0000 | 00.0000 | 1 | | | | |
| 813- GRID | 17 | 1 | 1.0000 | 36.0000 | 00.0000 | 1 | | | | |
| 814- GRID | 18 | 1 | 1.0000 | 45.0000 | 00.0000 | 1 | | | | |
| 815- GRID | 19 | 1 | 1.0000 | 54.0000 | 00.0000 | 1 | | | | |
| 816- GRID | 20 | 1 | 1.0000 | 63.0000 | 00.0000 | 1 | | | | |
| 817- GRID | 21 | 1 | 1.0000 | 72.0000 | 00.0000 | 1 | | | | |
| 818- GRID | 22 | 1 | 1.0000 | 81.0000 | 00.0000 | 1 | | | | |
| 819- GRID | 23 | 1 | 1.0000 | 90.0000 | 00.0000 | 1 | | | | |
| 820- GRID | 24 | 1 | 1.0000 | 00.0000 | 00.0000 | 1 | | | | |
| 821- GRID | 25 | 1 | 1.0000 | 9.0000 | 00.0000 | 1 | | | | |
| 822- GRID | 26 | 1 | 1.0000 | 18.0000 | 00.0000 | 1 | | | | |
| 823- GRID | 27 | 1 | 1.0000 | 27.0000 | 00.0000 | 1 | | | | |
| 824- GRID | 28 | 1 | 1.0000 | 36.0000 | 00.0000 | 1 | | | | |
| 825- GRID | 29 | 1 | 1.0000 | 45.0000 | 00.0000 | 1 | | | | |
| 826- GRID | 30 | 1 | 1.0000 | 54.0000 | 00.0000 | 1 | | | | |
| 827- GRID | 31 | 1 | 1.0000 | 63.0000 | 00.0000 | 1 | | | | |
| 828- GRID | 32 | 1 | 1.0000 | 72.0000 | 00.0000 | 1 | | | | |
| 829- GRID | 33 | 1 | 1.0000 | 81.0000 | 00.0000 | 1 | | | | |
| 830- GRID | 34 | 1 | 1.0000 | 90.0000 | 00.0000 | 1 | | | | |
| 831- GRID | 35 | 1 | 1.0000 | 00.0000 | 00.0000 | 1 | | | | |
| 832- GRID | 36 | 1 | 1.0000 | 9.0000 | 00.0000 | 1 | | | | |
| 833- GRID | 37 | 1 | 1.0000 | 18.0000 | 00.0000 | 1 | | | | |
| 834- GRID | 38 | 1 | 1.0000 | 27.0000 | 00.0000 | 1 | | | | |
| 835- GRID | 39 | 1 | 1.0000 | 36.0000 | 00.0000 | 1 | | | | |
| 836- GRID | 40 | 1 | 1.0000 | 45.0000 | 00.0000 | 1 | | | | |
| 837- GRID | 41 | 1 | 1.0000 | 54.0000 | 00.0000 | 1 | | | | |
| 838- GRID | 42 | 1 | 1.0000 | 63.0000 | 00.0000 | 1 | | | | |
| 839- GRID | 43 | 1 | 1.0000 | 72.0000 | 00.0000 | 1 | | | | |
| 840- GRID | 44 | 1 | 1.0000 | 81.0000 | 00.0000 | 1 | | | | |
| 841- GRID | 45 | 1 | 1.0000 | 90.0000 | 00.0000 | 1 | | | | |
| 842- GRID | 46 | 1 | 1.0000 | 00.0000 | 00.0000 | 1 | | | | |
| 843- GRID | 47 | 1 | 1.0000 | 9.0000 | 00.0000 | 1 | | | | |
| 844- GRID | 48 | 1 | 1.0000 | 18.0000 | 00.0000 | 1 | | | | |
| 845- GRID | 49 | 1 | 1.0000 | 27.0000 | 00.0000 | 1 | | | | |
| 846- GRID | 50 | 1 | 1.0000 | 36.0000 | 00.0000 | 1 | | | | |
| 847- GRID | 51 | 1 | 1.0000 | 45.0000 | 00.0000 | 1 | | | | |
| 848- GRID | 52 | 1 | 1.0000 | 54.0000 | 00.0000 | 1 | | | | |
| 849- GRID | 53 | 1 | 1.0000 | 63.0000 | 00.0000 | 1 | | | | |
| 850- GRID | 54 | 1 | 1.0000 | 72.0000 | 00.0000 | 1 | | | | |

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MAY 4. 1974 NASTRAN 5/13/72

AXISYMMETRIC CIRC. CYL. WITH FLUID
HARMONIC REDUCTION

SORTED BULK DATA ECHO

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|------|-------|---|--------|---------|---------|---|---|---|----|
| COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 901- | GRID | 105 | 1 | 1.0000 | 36.0000 | -0.7999 | 1 | | | |
| 902- | GRID | 106 | 1 | 1.0000 | 45.0000 | -0.7999 | 1 | | | |
| 903- | GRID | 107 | 1 | 1.0000 | 54.0000 | -0.7999 | 1 | | | |
| 904- | GRID | 108 | 1 | 1.0000 | 63.0000 | -0.7999 | 1 | | | |
| 905- | GRID | 109 | 1 | 1.0000 | 72.0000 | -0.7999 | 1 | | | |
| 906- | GRID | 110 | 1 | 1.0000 | 81.0000 | -0.7999 | 1 | | | |
| 907- | GRID | 111 | 1 | 1.0000 | 90.0000 | -0.7999 | 1 | | | |
| 908- | GRID | 112 | 1 | 1.0000 | .0000 | -1.0000 | 1 | | | |
| 909- | GRID | 113 | 1 | 1.0000 | 9.0000 | -1.0000 | 1 | | | |
| 910- | GRID | 114 | 1 | 1.0000 | 18.0000 | -1.0000 | 1 | | | |
| 911- | GRID | 115 | 1 | 1.0000 | 27.0000 | -1.0000 | 1 | | | |
| 912- | GRID | 116 | 1 | 1.0000 | 36.0000 | -1.0000 | 1 | | | |
| 913- | GRID | 117 | 1 | 1.0000 | 45.0000 | -1.0000 | 1 | | | |
| 914- | GRID | 118 | 1 | 1.0000 | 54.0000 | -1.0000 | 1 | | | |
| 915- | GRID | 119 | 1 | 1.0000 | 63.0000 | -1.0000 | 1 | | | |
| 916- | GRID | 120 | 1 | 1.0000 | 72.0000 | -1.0000 | 1 | | | |
| 917- | GRID | 121 | 1 | 1.0000 | 81.0000 | -1.0000 | 1 | | | |
| 918- | GRID | 122 | 1 | 1.0000 | 90.0000 | -1.0000 | 1 | | | |
| 919- | GRID | 1001 | 1 | 1. | 0.0 | 0.0 | 1 | | | |
| 920- | GRID | 1002 | 1 | 1. | 0.0 | 0.0 | 1 | | | |
| 921- | GRID | 1003 | 1 | 1. | 0.0 | 0.0 | 1 | | | |
| 922- | GRID | 2001 | 1 | 1. | 0.0 | 0.0 | 1 | | | |
| 923- | GRID | 2002 | 1 | 1. | 0.0 | 0.0 | 1 | | | |
| 924- | GRID | 2003 | 1 | 1. | 0.0 | 0.0 | 1 | | | |
| 925- | GRID | 3001 | 1 | 1. | 0.0 | 0.0 | 1 | | | |
| 926- | GRID | 3002 | 1 | 1. | 0.0 | 0.0 | 1 | | | |
| 927- | GRID | 3003 | 1 | 1. | 0.0 | 0.0 | 1 | | | |
| 928- | GRID | 4001 | 1 | 1. | 0.0 | 0.0 | 1 | | | |
| 929- | GRID | 4002 | 1 | 1. | 0.0 | 0.0 | 1 | | | |
| 930- | GRID | 4003 | 1 | 1. | 0.0 | 0.0 | 1 | | | |
| 931- | GRID | 5001 | 1 | 1. | 0.0 | 0.0 | 1 | | | |
| 932- | GRID | 5002 | 1 | 1. | 0.0 | 0.0 | 1 | | | |
| 933- | GRID | 5003 | 1 | 1. | 0.0 | 0.0 | 1 | | | |
| 934- | GRID | 6001 | 1 | 1. | 0.0 | 0.0 | 1 | | | |
| 935- | GRID | 6002 | 1 | 1. | 0.0 | 0.0 | 1 | | | |
| 936- | GRID | 6003 | 1 | 1. | 0.0 | 0.0 | 1 | | | |
| 937- | GRID | 7001 | 1 | 1. | 0.0 | 0.0 | 1 | | | |
| 938- | GRID | 7002 | 1 | 1. | 0.0 | 0.0 | 1 | | | |
| 939- | GRID | 7003 | 1 | 1. | 0.0 | 0.0 | 1 | | | |
| 940- | GRID | 8001 | 1 | 1. | 0.0 | 0.0 | 1 | | | |
| 941- | GRID | 8002 | 1 | 1. | 0.0 | 0.0 | 1 | | | |
| 942- | GRID | 8003 | 1 | 1. | 0.0 | 0.0 | 1 | | | |
| 943- | GRID | 9001 | 1 | 1. | 0.0 | 0.0 | 1 | | | |
| 944- | GRID | 9002 | 1 | 1. | 0.0 | 0.0 | 1 | | | |
| 945- | GRID | 9003 | 1 | 1. | 0.0 | 0.0 | 1 | | | |
| 946- | GRID | 10001 | 1 | 1. | 0.0 | 0.0 | 1 | | | |
| 947- | GRID | 10002 | 1 | 1. | 0.0 | 0.0 | 1 | | | |
| 948- | GRID | 10003 | 1 | 1. | 0.0 | 0.0 | 1 | | | |
| 949- | GRID | 11001 | 1 | 1. | 0.0 | 0.0 | 1 | | | |
| 950- | GRID | 11002 | 1 | 1. | 0.0 | 0.0 | 1 | | | |

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OF POOR QUALITY

| SORTED BULK DATA ECHO | | | | | | | | | | |
|-----------------------|---------|-------|---|------|-----|--------------|---|---------|---|---------|
| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| COUNT | GRID | 11003 | 1 | 1 | 0.0 | 0.0 | 1 | | | |
| 951- | MAT1 | 1 | 1 | 1 | 0.0 | 0.0 | 1 | | | |
| 952- | MPC | 1 | 2 | 1 | 3 | 3 | | | | |
| 953- | | | | | | | | | | |
| 954- | EM11011 | | | | | | | | | EM11011 |
| 955- | MPC | 1 | 2 | 1002 | 1 | -1.000001001 | 1 | 1.00000 | | |
| 956- | | | | | | | | | | |
| 957- | EM11012 | | | | | | | | | EM11012 |
| 958- | MPC | 1 | 2 | 1002 | 2 | -1.000001001 | 2 | .00000 | | |
| 959- | | | | | | | | | | |
| 960- | EM11013 | | | | | | | | | EM11013 |
| 961- | MPC | 1 | 2 | 1002 | 3 | -1.000001001 | 3 | 1.00000 | | |
| 962- | | | | | | | | | | |
| 963- | EM11014 | | | | | | | | | EM11014 |
| 964- | MPC | 1 | 2 | 1002 | 4 | -1.000001001 | 4 | .00000 | | |
| 965- | | | | | | | | | | |
| 966- | EM11015 | | | | | | | | | EM11015 |
| 967- | MPC | 1 | 2 | 1002 | 5 | -1.000001001 | 5 | 1.00000 | | |
| 968- | | | | | | | | | | |
| 969- | EM11016 | | | | | | | | | EM11016 |
| 970- | MPC | 1 | 2 | 1002 | 6 | -1.000001001 | 6 | .00000 | | |
| 971- | | | | | | | | | | |
| 972- | EM11021 | | | | | | | | | EM11021 |
| 973- | MPC | 1 | 3 | 1002 | 1 | -1.000001001 | 1 | 1.00000 | | |
| 974- | | | | | | | | | | |
| 975- | EM11022 | | | | | | | | | EM11022 |
| 976- | MPC | 1 | 3 | 1002 | 2 | -1.000001001 | 2 | .00000 | | |
| 977- | | | | | | | | | | |
| 978- | EM11023 | | | | | | | | | EM11023 |
| 979- | MPC | 1 | 3 | 1002 | 3 | -1.000001001 | 3 | 1.00000 | | |
| 980- | | | | | | | | | | |
| 981- | EM11024 | | | | | | | | | EM11024 |
| 982- | MPC | 1 | 3 | 1002 | 4 | -1.000001001 | 4 | .00000 | | |
| 983- | | | | | | | | | | |
| 984- | EM11025 | | | | | | | | | EM11025 |
| 985- | MPC | 1 | 3 | 1002 | 5 | -1.000001001 | 5 | 1.00000 | | |
| 986- | | | | | | | | | | |
| 987- | EM11026 | | | | | | | | | EM11026 |
| 988- | MPC | 1 | 3 | 1002 | 6 | -1.000001001 | 6 | .00000 | | |
| 989- | | | | | | | | | | |
| 990- | EM11031 | | | | | | | | | EM11031 |
| 991- | MPC | 1 | 4 | 1002 | 1 | -1.000001001 | 1 | 1.00000 | | |
| 992- | | | | | | | | | | |
| 993- | EM11032 | | | | | | | | | EM11032 |
| 994- | MPC | 1 | 4 | 1002 | 2 | -1.000001001 | 2 | .00000 | | |
| 995- | | | | | | | | | | |
| 996- | EM11033 | | | | | | | | | EM11033 |
| 997- | MPC | 1 | 4 | 1002 | 3 | -1.000001001 | 3 | 1.00000 | | |
| 998- | | | | | | | | | | |
| 999- | EM11034 | | | | | | | | | EM11034 |
| 1000- | MPC | 1 | 4 | 1002 | 4 | -1.000001001 | 4 | .00000 | | |
| | | | | | | | | | | |
| | EM11035 | | | | | | | | | EM11035 |
| | MPC | 1 | 4 | 1002 | 5 | -1.000001001 | 5 | 1.00000 | | |
| | | | | | | | | | | |
| | EM11036 | | | | | | | | | EM11036 |
| | MPC | 1 | 4 | 1002 | 6 | -1.000001001 | 6 | .00000 | | |
| | | | | | | | | | | |
| | EM11041 | | | | | | | | | EM11041 |
| | MPC | 1 | 5 | 1002 | 1 | -1.000001001 | 1 | 1.00000 | | |
| | | | | | | | | | | |
| | EM11042 | | | | | | | | | EM11042 |
| | MPC | 1 | 5 | 1002 | 2 | -1.000001001 | 2 | .00000 | | |
| | | | | | | | | | | |
| | EM11043 | | | | | | | | | EM11043 |
| | MPC | 1 | 5 | 1002 | 3 | -1.000001001 | 3 | 1.00000 | | |
| | | | | | | | | | | |
| | EM11044 | | | | | | | | | EM11044 |
| | MPC | 1 | 5 | 1002 | 4 | -1.000001001 | 4 | .00000 | | |
| | | | | | | | | | | |
| | EM11045 | | | | | | | | | EM11045 |
| | MPC | 1 | 5 | 1002 | 5 | -1.000001001 | 5 | 1.00000 | | |
| | | | | | | | | | | |
| | EM11046 | | | | | | | | | EM11046 |
| | MPC | 1 | 5 | 1002 | 6 | -1.000001001 | 6 | .00000 | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

MAY 4 1972 NASIRAN 5/13/72

AXISYMMETRIC CIRC. CYL. WITH FLUID
HARMONIC REDUCTION

| SORTED BULK DATA ECHO | | | | | | | | | |
|-----------------------|---|----|------|---|---------------|------|---------|-----------|---------|
| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 1001- | 1 | 6 | 1002 | 1 | 1-1.300001001 | 1 | 1.00000 | 1-0.80901 | EM11051 |
| 1002- | 1 | 6 | 1002 | 2 | 1-1.300001001 | 1003 | 2 | 0.00000 | EM11052 |
| 1003- | 1 | 6 | 1002 | 2 | 1-1.300001001 | 1003 | 2 | 0.58778 | EM11053 |
| 1004- | 1 | 6 | 1002 | 3 | 1-1.300001001 | 1003 | 3 | 1.00000 | EM11054 |
| 1005- | 1 | 6 | 1002 | 3 | 1-1.300001001 | 1003 | 3 | 0.80901 | EM11055 |
| 1006- | 1 | 6 | 1002 | 4 | 1-1.300001001 | 1003 | 4 | 0.00000 | EM11056 |
| 1007- | 1 | 6 | 1002 | 4 | 1-1.300001001 | 1003 | 4 | 0.58778 | EM11061 |
| 1008- | 1 | 6 | 1002 | 5 | 1-1.300001001 | 1003 | 5 | 1.00000 | EM11062 |
| 1009- | 1 | 6 | 1002 | 5 | 1-1.300001001 | 1003 | 5 | 0.80901 | EM11063 |
| 1010- | 1 | 6 | 1002 | 6 | 1-1.300001001 | 1003 | 6 | 0.00000 | EM11064 |
| 1011- | 1 | 6 | 1002 | 6 | 1-1.300001001 | 1003 | 6 | 0.58778 | EM11065 |
| 1012- | 1 | 7 | 1002 | 1 | 1-1.300001001 | 1003 | 1 | 1.00000 | EM11066 |
| 1013- | 1 | 7 | 1002 | 2 | 1-1.300001001 | 1003 | 2 | 0.00000 | EM11071 |
| 1014- | 1 | 7 | 1002 | 2 | 1-1.300001001 | 1003 | 2 | 0.00000 | EM11072 |
| 1015- | 1 | 7 | 1002 | 3 | 1-1.300001001 | 1003 | 3 | 1.00000 | EM11073 |
| 1016- | 1 | 7 | 1002 | 3 | 1-1.300001001 | 1003 | 3 | 0.80901 | EM11074 |
| 1017- | 1 | 7 | 1002 | 4 | 1-1.300001001 | 1003 | 4 | 0.00000 | EM11075 |
| 1018- | 1 | 7 | 1002 | 4 | 1-1.300001001 | 1003 | 4 | 0.58778 | EM11076 |
| 1019- | 1 | 7 | 1002 | 5 | 1-1.300001001 | 1003 | 5 | 1.00000 | EM11081 |
| 1020- | 1 | 7 | 1002 | 5 | 1-1.300001001 | 1003 | 5 | 0.80901 | EM11082 |
| 1021- | 1 | 7 | 1002 | 6 | 1-1.300001001 | 1003 | 6 | 0.00000 | EM11083 |
| 1022- | 1 | 7 | 1002 | 6 | 1-1.300001001 | 1003 | 6 | 0.58778 | EM11084 |
| 1023- | 1 | 8 | 1002 | 1 | 1-1.300001001 | 1003 | 1 | 1.00000 | EM11085 |
| 1024- | 1 | 8 | 1002 | 2 | 1-1.300001001 | 1003 | 2 | 0.00000 | EM11086 |
| 1025- | 1 | 8 | 1002 | 2 | 1-1.300001001 | 1003 | 2 | 0.80901 | EM11091 |
| 1026- | 1 | 8 | 1002 | 3 | 1-1.300001001 | 1003 | 3 | 1.00000 | EM11092 |
| 1027- | 1 | 8 | 1002 | 3 | 1-1.300001001 | 1003 | 3 | 0.80901 | EM11093 |
| 1028- | 1 | 8 | 1002 | 4 | 1-1.300001001 | 1003 | 4 | 0.00000 | EM11094 |
| 1029- | 1 | 8 | 1002 | 4 | 1-1.300001001 | 1003 | 4 | 0.58778 | EM11095 |
| 1030- | 1 | 8 | 1002 | 5 | 1-1.300001001 | 1003 | 5 | 1.00000 | EM11096 |
| 1031- | 1 | 8 | 1002 | 5 | 1-1.300001001 | 1003 | 5 | 0.80901 | EM11097 |
| 1032- | 1 | 8 | 1002 | 6 | 1-1.300001001 | 1003 | 6 | 0.00000 | EM11098 |
| 1033- | 1 | 8 | 1002 | 6 | 1-1.300001001 | 1003 | 6 | 0.58778 | EM11099 |
| 1034- | 1 | 9 | 1002 | 1 | 1-1.300001001 | 1003 | 1 | 1.00000 | EM11100 |
| 1035- | 1 | 9 | 1002 | 2 | 1-1.300001001 | 1003 | 2 | 0.00000 | EM11101 |
| 1036- | 1 | 9 | 1002 | 2 | 1-1.300001001 | 1003 | 2 | 0.80901 | EM11102 |
| 1037- | 1 | 9 | 1002 | 3 | 1-1.300001001 | 1003 | 3 | 1.00000 | EM11103 |
| 1038- | 1 | 9 | 1002 | 3 | 1-1.300001001 | 1003 | 3 | 0.80901 | EM11104 |
| 1039- | 1 | 9 | 1002 | 4 | 1-1.300001001 | 1003 | 4 | 0.00000 | EM11105 |
| 1040- | 1 | 9 | 1002 | 4 | 1-1.300001001 | 1003 | 4 | 0.58778 | EM11106 |
| 1041- | 1 | 9 | 1002 | 5 | 1-1.300001001 | 1003 | 5 | 1.00000 | EM11107 |
| 1042- | 1 | 9 | 1002 | 5 | 1-1.300001001 | 1003 | 5 | 0.80901 | EM11108 |
| 1043- | 1 | 9 | 1002 | 6 | 1-1.300001001 | 1003 | 6 | 0.00000 | EM11109 |
| 1044- | 1 | 9 | 1002 | 6 | 1-1.300001001 | 1003 | 6 | 0.58778 | EM11110 |
| 1045- | 1 | 9 | 1002 | 7 | 1-1.300001001 | 1003 | 7 | 1.00000 | EM11111 |
| 1046- | 1 | 9 | 1002 | 7 | 1-1.300001001 | 1003 | 7 | 0.80901 | EM11112 |
| 1047- | 1 | 10 | 1002 | 1 | 1-1.300001001 | 1003 | 1 | 1.00000 | EM11113 |
| 1048- | 1 | 10 | 1002 | 1 | 1-1.300001001 | 1003 | 1 | 0.80901 | EM11114 |
| 1049- | 1 | 10 | 1002 | 2 | 1-1.300001001 | 1003 | 2 | 0.00000 | EM11115 |
| 1050- | 1 | 10 | 1002 | 2 | 1-1.300001001 | 1003 | 2 | 0.58778 | EM11116 |

ORIGINAL PAGE IS
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HARMONIC REDUCTION

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---|----|------|---|--------------|------|---|-----------|---|---------|
| COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 1051- | 1 | 10 | 1002 | 2 | -1.000001001 | 2 | | .00000 | | EM11092 |
| 1052- | 1 | 10 | 1002 | 2 | 0.58778 | 1003 | | 2-0.95105 | | |
| 1053- | 1 | 10 | 1002 | 3 | -1.000001001 | 3 | | 1.00000 | | EM11093 |
| 1054- | 1 | 10 | 1002 | 4 | 3-0.30901 | 1003 | | 3 0.30901 | | |
| 1055- | 1 | 10 | 1002 | 4 | -1.000001001 | 4 | | .00000 | | EM11094 |
| 1056- | 1 | 10 | 1002 | 5 | 4 0.58778 | 1003 | | 4-0.95105 | | |
| 1057- | 1 | 10 | 1002 | 5 | -1.000001001 | 5 | | 1.00000 | | EM11095 |
| 1058- | 1 | 10 | 1002 | 6 | 5-0.30901 | 1003 | | 5 0.30901 | | |
| 1059- | 1 | 10 | 1002 | 6 | -1.000001001 | 6 | | .00000 | | EM11096 |
| 1060- | 1 | 11 | 1002 | 1 | 6 0.58778 | 1003 | | 6-0.95105 | | |
| 1061- | 1 | 11 | 1002 | 1 | -1.000001001 | 1 | | 1.00000 | | EM11101 |
| 1062- | 1 | 11 | 1002 | 2 | 1-0.45105 | 1003 | | 1 0.80901 | | |
| 1063- | 1 | 11 | 1002 | 2 | -1.000001001 | 2 | | .00000 | | EM11102 |
| 1064- | 1 | 11 | 1002 | 3 | 2 0.30901 | 1003 | | 2-0.58778 | | |
| 1065- | 1 | 11 | 1002 | 3 | -1.000001001 | 3 | | 1.00000 | | EM11103 |
| 1066- | 1 | 11 | 1002 | 4 | 3-0.45105 | 1003 | | 3 0.80901 | | |
| 1067- | 1 | 11 | 1002 | 4 | -1.000001001 | 4 | | .00000 | | EM11104 |
| 1068- | 1 | 11 | 1002 | 5 | 4 0.58778 | 1003 | | 4-0.95105 | | |
| 1069- | 1 | 11 | 1002 | 5 | -1.000001001 | 5 | | 1.00000 | | EM11105 |
| 1070- | 1 | 11 | 1002 | 6 | 5-0.30901 | 1003 | | 5 0.80901 | | |
| 1071- | 1 | 11 | 1002 | 6 | -1.000001001 | 6 | | .00000 | | EM11106 |
| 1072- | 1 | 12 | 1002 | 1 | 6 0.30901 | 1003 | | 6-0.58778 | | |
| 1073- | 1 | 12 | 1002 | 1 | -1.000001001 | 1 | | 1.00000 | | EM11111 |
| 1074- | 1 | 12 | 1002 | 2 | 1-1.00000 | 1003 | | 1 1.00000 | | |
| 1075- | 1 | 12 | 1002 | 2 | -1.000001001 | 2 | | .00000 | | EM11112 |
| 1076- | 1 | 12 | 1002 | 3 | 2 0.30901 | 1003 | | 2-0.58778 | | |
| 1077- | 1 | 12 | 1002 | 3 | -1.000001001 | 3 | | 1.00000 | | EM11113 |
| 1078- | 1 | 12 | 1002 | 4 | 3-1.00000 | 1003 | | 3 1.00000 | | |
| 1079- | 1 | 12 | 1002 | 4 | -1.000001001 | 4 | | .00000 | | EM11114 |
| 1080- | 1 | 12 | 1002 | 5 | 4 0.30901 | 1003 | | 4-0.58778 | | |
| 1081- | 1 | 12 | 1002 | 5 | -1.000001001 | 5 | | 1.00000 | | EM11115 |
| 1082- | 1 | 12 | 1002 | 6 | 5-1.00000 | 1003 | | 5 1.00000 | | |
| 1083- | 1 | 12 | 1002 | 6 | -1.000001001 | 6 | | .00000 | | EM11116 |
| 1084- | 1 | 13 | 1002 | 1 | 6 0.30901 | 1003 | | 6-0.58778 | | |
| 1085- | 1 | 13 | 1002 | 1 | -1.000002001 | 1 | | 1.00000 | | EM12011 |
| 1086- | 1 | 13 | 1002 | 2 | 1 1.00000 | 2003 | | 1 1.00000 | | |
| 1087- | 1 | 13 | 1002 | 2 | -1.000002001 | 2 | | .00000 | | EM12012 |
| 1088- | 1 | 13 | 1002 | 3 | 2 0.00000 | 2003 | | 2 0.00000 | | |
| 1089- | 1 | 13 | 1002 | 3 | -1.000002001 | 3 | | 1.00000 | | EM12013 |
| 1090- | 1 | 13 | 1002 | 4 | 3 1.00000 | 2003 | | 3 1.00000 | | |
| 1091- | 1 | 13 | 1002 | 4 | -1.000002001 | 4 | | .00000 | | EM12014 |
| 1092- | 1 | 13 | 1002 | 5 | 4 0.00000 | 2003 | | 4 0.00000 | | |
| 1093- | 1 | 13 | 1002 | 5 | -1.000002001 | 5 | | 1.00000 | | EM12015 |
| 1094- | 1 | 13 | 1002 | 6 | 5 1.00000 | 2003 | | 5 1.00000 | | |
| 1095- | 1 | 13 | 1002 | 6 | -1.000002001 | 6 | | .00000 | | EM12016 |
| 1096- | 1 | 14 | 1002 | 1 | 6 0.00000 | 2003 | | 6 0.00000 | | |
| 1097- | 1 | 14 | 1002 | 1 | -1.000002001 | 1 | | 1.00000 | | EM12021 |
| 1098- | 1 | 14 | 1002 | 2 | 1 0.45105 | 2003 | | 1 0.80901 | | |
| 1099- | 1 | 14 | 1002 | 2 | -1.000002001 | 2 | | .00000 | | EM12022 |
| 1100- | 1 | 14 | 1002 | 2 | 2 0.30901 | 2003 | | 2 0.58778 | | |

SORTED B J L K DATA E C H O

| CARD
COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------------|---------|---|------|---|--------------|---|---------|-----------|---------|----|
| 1101- | MPC | 1 | 14 | 3 | -1.000000001 | 3 | 1.00000 | 3 0.80901 | EM12023 | |
| 1102- | EM12023 | | 2002 | 4 | -1.000000001 | 4 | .00000 | 4 0.58778 | EM12024 | |
| 1103- | MPC | 1 | 14 | 5 | -1.000000001 | 5 | 1.00000 | 5 0.80901 | EM12025 | |
| 1104- | EM12024 | | 2002 | 6 | -1.000000001 | 6 | .00000 | 6 0.58778 | EM12026 | |
| 1105- | MPC | 1 | 14 | 1 | -1.000000001 | 1 | 1.00000 | 1 0.30901 | EM12031 | |
| 1106- | EM12025 | | 2002 | 2 | -1.000000001 | 2 | .00000 | 2 0.95105 | EM12032 | |
| 1107- | MPC | 1 | 14 | 3 | -1.000000001 | 3 | 1.00000 | 3 0.30901 | EM12033 | |
| 1108- | EM12026 | | 2002 | 4 | -1.000000001 | 4 | .00000 | 4 0.95105 | EM12034 | |
| 1109- | MPC | 1 | 15 | 5 | -1.000000001 | 5 | 1.00000 | 5 0.30901 | EM12035 | |
| 1110- | EM12031 | | 2002 | 6 | -1.000000001 | 6 | .00000 | 6 0.95105 | EM12036 | |
| 1111- | MPC | 1 | 15 | 1 | -1.000000001 | 1 | 1.00000 | 1 0.30901 | EM12041 | |
| 1112- | EM12032 | | 2002 | 2 | -1.000000001 | 2 | .00000 | 2 0.95105 | EM12042 | |
| 1113- | MPC | 1 | 15 | 3 | -1.000000001 | 3 | 1.00000 | 3 0.30901 | EM12043 | |
| 1114- | EM12033 | | 2002 | 4 | -1.000000001 | 4 | .00000 | 4 0.95105 | EM12044 | |
| 1115- | MPC | 1 | 15 | 5 | -1.000000001 | 5 | 1.00000 | 5 0.30901 | EM12045 | |
| 1116- | EM12034 | | 2002 | 6 | -1.000000001 | 6 | .00000 | 6 0.95105 | EM12046 | |
| 1117- | MPC | 1 | 15 | 1 | -1.000000001 | 1 | 1.00000 | 1 0.30901 | EM12051 | |
| 1118- | EM12035 | | 2002 | 2 | -1.000000001 | 2 | .00000 | 2 0.95105 | EM12052 | |
| 1119- | MPC | 1 | 15 | 3 | -1.000000001 | 3 | 1.00000 | 3 0.30901 | EM12053 | |
| 1120- | EM12036 | | 2002 | 4 | -1.000000001 | 4 | .00000 | 4 0.95105 | EM12054 | |
| 1121- | MPC | 1 | 16 | 5 | -1.000000001 | 5 | 1.00000 | 5 0.30901 | EM12055 | |
| 1122- | EM12041 | | 2002 | 6 | -1.000000001 | 6 | .00000 | 6 0.95105 | EM12056 | |
| 1123- | MPC | 1 | 16 | 1 | -1.000000001 | 1 | 1.00000 | 1 0.30901 | EM12061 | |
| 1124- | EM12042 | | 2002 | 2 | -1.000000001 | 2 | .00000 | 2 0.95105 | EM12062 | |
| 1125- | MPC | 1 | 16 | 3 | -1.000000001 | 3 | 1.00000 | 3 0.30901 | EM12063 | |
| 1126- | EM12043 | | 2002 | 4 | -1.000000001 | 4 | .00000 | 4 0.95105 | | |
| 1127- | MPC | 1 | 16 | 5 | -1.000000001 | 5 | 1.00000 | 5 0.30901 | | |
| 1128- | EM12044 | | 2002 | 6 | -1.000000001 | 6 | .00000 | 6 0.95105 | | |
| 1129- | MPC | 1 | 16 | 1 | -1.000000001 | 1 | 1.00000 | 1 0.30901 | | |
| 1130- | EM12045 | | 2002 | 2 | -1.000000001 | 2 | .00000 | 2 0.95105 | | |
| 1131- | MPC | 1 | 16 | 3 | -1.000000001 | 3 | 1.00000 | 3 0.30901 | | |
| 1132- | EM12046 | | 2002 | 4 | -1.000000001 | 4 | .00000 | 4 0.95105 | | |
| 1133- | MPC | 1 | 17 | 5 | -1.000000001 | 5 | 1.00000 | 5 0.30901 | | |
| 1134- | EM12051 | | 2002 | 6 | -1.000000001 | 6 | .00000 | 6 0.95105 | | |
| 1135- | MPC | 1 | 17 | 1 | -1.000000001 | 1 | 1.00000 | 1 0.30901 | | |
| 1136- | EM12052 | | 2002 | 2 | -1.000000001 | 2 | .00000 | 2 0.95105 | | |
| 1137- | MPC | 1 | 17 | 3 | -1.000000001 | 3 | 1.00000 | 3 0.30901 | | |
| 1138- | EM12053 | | 2002 | 4 | -1.000000001 | 4 | .00000 | 4 0.95105 | | |
| 1139- | MPC | 1 | 17 | 5 | -1.000000001 | 5 | 1.00000 | 5 0.30901 | | |
| 1140- | EM12054 | | 2002 | 6 | -1.000000001 | 6 | .00000 | 6 0.95105 | | |
| 1141- | MPC | 1 | 17 | 1 | -1.000000001 | 1 | 1.00000 | 1 0.30901 | | |
| 1142- | EM12055 | | 2002 | 2 | -1.000000001 | 2 | .00000 | 2 0.95105 | | |
| 1143- | MPC | 1 | 17 | 3 | -1.000000001 | 3 | 1.00000 | 3 0.30901 | | |
| 1144- | EM12056 | | 2002 | 4 | -1.000000001 | 4 | .00000 | 4 0.95105 | | |
| 1145- | MPC | 1 | 18 | 5 | -1.000000001 | 5 | 1.00000 | 5 0.30901 | | |
| 1146- | EM12061 | | 2002 | 6 | -1.000000001 | 6 | .00000 | 6 0.95105 | | |
| 1147- | MPC | 1 | 18 | 1 | -1.000000001 | 1 | 1.00000 | 1 0.30901 | | |
| 1148- | EM12062 | | 2002 | 2 | -1.000000001 | 2 | .00000 | 2 0.95105 | | |
| 1149- | MPC | 1 | 18 | 3 | -1.000000001 | 3 | 1.00000 | 3 0.30901 | | |
| 1150- | EM12063 | | 2002 | 4 | -1.000000001 | 4 | .00000 | 4 0.95105 | | |

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OF POOR QUALITY

Volume II

SORTED BULK DATA ECHO

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---|----|------|---|--------------|------|------------|---|---|---------|
| 1151- | 1 | 18 | 2002 | 4 | -1.000000001 | 4 | .00000 | | | CM12064 |
| 1152- | 1 | 18 | 2002 | 5 | 4 1.00000 | 2003 | 4 0.00000 | | | CM12065 |
| 1153- | 1 | 18 | 2002 | 5 | -1.000000001 | 2003 | 5 1.00000 | | | CM12066 |
| 1154- | 1 | 18 | 2002 | 6 | 5 0.00000 | 2003 | 5 -1.00000 | | | CM12067 |
| 1155- | 1 | 18 | 2002 | 6 | -1.000000001 | 2003 | 6 0.00000 | | | CM12068 |
| 1156- | 1 | 19 | 2002 | 1 | 6 1.00000 | 2003 | 6 0.00000 | | | CM12069 |
| 1157- | 1 | 19 | 2002 | 1 | -1.000000001 | 2003 | 1 1.00000 | | | CM12070 |
| 1158- | 1 | 19 | 2002 | 2 | 1-0.30901 | 2003 | 1-0.86901 | | | CM12071 |
| 1159- | 1 | 19 | 2002 | 2 | -1.000000001 | 2003 | .00000 | | | CM12072 |
| 1160- | 1 | 19 | 2002 | 3 | 2 0.95105 | 2003 | 2-0.52778 | | | CM12073 |
| 1161- | 1 | 19 | 2002 | 3 | -1.000000001 | 2003 | 3 1.00000 | | | CM12074 |
| 1162- | 1 | 19 | 2002 | 4 | 3-0.30901 | 2003 | 3-0.80901 | | | CM12075 |
| 1163- | 1 | 19 | 2002 | 4 | -1.000000001 | 2003 | .00000 | | | CM12076 |
| 1164- | 1 | 19 | 2002 | 5 | 4 0.95105 | 2003 | 4-0.52778 | | | CM12077 |
| 1165- | 1 | 19 | 2002 | 5 | -1.000000001 | 2003 | 5 1.00000 | | | CM12078 |
| 1166- | 1 | 19 | 2002 | 6 | 5-0.30901 | 2003 | 5-0.80901 | | | CM12079 |
| 1167- | 1 | 20 | 2002 | 1 | -1.000000001 | 2003 | .00000 | | | CM12080 |
| 1168- | 1 | 20 | 2002 | 1 | 6 0.95105 | 2003 | 6-0.52778 | | | CM12081 |
| 1169- | 1 | 20 | 2002 | 2 | -1.000000001 | 2003 | 1 1.00000 | | | CM12082 |
| 1170- | 1 | 20 | 2002 | 2 | 1-0.52778 | 2003 | 1-0.30901 | | | CM12083 |
| 1171- | 1 | 20 | 2002 | 3 | -1.000000001 | 2003 | 2-0.95105 | | | CM12084 |
| 1172- | 1 | 20 | 2002 | 3 | 2 0.80901 | 2003 | 2-0.95105 | | | CM12085 |
| 1173- | 1 | 20 | 2002 | 4 | -1.000000001 | 2003 | 3 1.00000 | | | CM12086 |
| 1174- | 1 | 20 | 2002 | 4 | 3-0.52778 | 2003 | 3-0.30901 | | | CM12087 |
| 1175- | 1 | 20 | 2002 | 5 | -1.000000001 | 2003 | .00000 | | | CM12088 |
| 1176- | 1 | 20 | 2002 | 5 | 4 0.86901 | 2003 | 4-0.95105 | | | CM12089 |
| 1177- | 1 | 20 | 2002 | 6 | -1.000000001 | 2003 | 5 1.00000 | | | CM12090 |
| 1178- | 1 | 20 | 2002 | 6 | 5-0.52778 | 2003 | 5-0.30901 | | | CM12091 |
| 1179- | 1 | 21 | 2002 | 1 | -1.000000001 | 2003 | .00000 | | | CM12092 |
| 1180- | 1 | 21 | 2002 | 1 | 6 0.80901 | 2003 | 6-0.95105 | | | CM12093 |
| 1181- | 1 | 21 | 2002 | 2 | -1.000000001 | 2003 | 1 1.00000 | | | CM12094 |
| 1182- | 1 | 21 | 2002 | 2 | 1-0.80901 | 2003 | 1 0.30901 | | | CM12095 |
| 1183- | 1 | 21 | 2002 | 3 | -1.000000001 | 2003 | .00000 | | | CM12096 |
| 1184- | 1 | 21 | 2002 | 3 | 2 0.52778 | 2003 | 2-0.95105 | | | CM12097 |
| 1185- | 1 | 21 | 2002 | 4 | -1.000000001 | 2003 | 3 1.00000 | | | CM12098 |
| 1186- | 1 | 21 | 2002 | 4 | 3-0.80901 | 2003 | 3 0.30901 | | | CM12099 |
| 1187- | 1 | 21 | 2002 | 5 | -1.000000001 | 2003 | .00000 | | | CM12100 |
| 1188- | 1 | 21 | 2002 | 5 | 4 0.52778 | 2003 | 4-0.95105 | | | CM12101 |
| 1189- | 1 | 21 | 2002 | 6 | -1.000000001 | 2003 | 5 1.00000 | | | CM12102 |
| 1190- | 1 | 21 | 2002 | 6 | 5-0.80901 | 2003 | 5 0.30901 | | | CM12103 |
| 1191- | 1 | 22 | 2002 | 1 | -1.000000001 | 2003 | .00000 | | | CM12104 |
| 1192- | 1 | 22 | 2002 | 1 | 6 0.52778 | 2003 | 6-0.95105 | | | CM12105 |
| 1193- | 1 | 22 | 2002 | 2 | -1.000000001 | 2003 | 1 1.00000 | | | CM12106 |
| 1194- | 1 | 22 | 2002 | 2 | 1-0.95105 | 2003 | 1 0.80901 | | | CM12107 |
| 1195- | 1 | 22 | 2002 | 3 | -1.000000001 | 2003 | .00000 | | | CM12108 |
| 1196- | 1 | 22 | 2002 | 3 | 2 0.30901 | 2003 | 2-0.52778 | | | CM12109 |
| 1197- | 1 | 22 | 2002 | 4 | -1.000000001 | 2003 | 3 1.00000 | | | CM12110 |
| 1198- | 1 | 22 | 2002 | 4 | 3-0.52778 | 2003 | 3 0.80901 | | | CM12111 |
| 1199- | 1 | 22 | 2002 | 5 | -1.000000001 | 2003 | .00000 | | | CM12112 |
| 1200- | 1 | 22 | 2002 | 5 | 4 0.30901 | 2003 | 4-0.52778 | | | CM12113 |

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AXISYMMETRIC CIRC. CYL. WITH FLUID
HARMONIC REDUCTION

SORTED BULK DATA ECHO

| CARD
COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------------|---|----|------|---|--------------|------|---------|-----------|---------|---------|
| 1201- | 1 | 22 | 2002 | 5 | -1.000002001 | 5 | 1.00000 | 5 | 1.00000 | EM12105 |
| 1202- | 1 | 22 | 2002 | 6 | 5-0.95105 | 2003 | 5 | 0.80901 | 5 | EM12106 |
| 1203- | 1 | 22 | 2002 | 6 | -1.000002001 | 2003 | 6 | 0.00000 | 6 | EM12106 |
| 1204- | 1 | 23 | 2002 | 1 | 6 0.30901 | 2003 | 1 | 6-0.58778 | 1 | EM12111 |
| 1205- | 1 | 23 | 2002 | 1 | -1.000002001 | 2003 | 1 | 1.00000 | 1 | EM12111 |
| 1206- | 1 | 23 | 2002 | 2 | 1-1.00000 | 2003 | 2 | 1 1.00000 | 2 | EM12112 |
| 1207- | 1 | 23 | 2002 | 2 | -1.000002001 | 2003 | 2 | 0.00000 | 2 | EM12112 |
| 1208- | 1 | 23 | 2002 | 3 | 2 0.00000 | 2003 | 3 | 2-0.00000 | 3 | EM12113 |
| 1209- | 1 | 23 | 2002 | 3 | -1.000002001 | 2003 | 3 | 1.00000 | 3 | EM12113 |
| 1210- | 1 | 23 | 2002 | 4 | 3-1.00000 | 2003 | 4 | 3 1.00000 | 4 | EM12114 |
| 1211- | 1 | 23 | 2002 | 4 | -1.000002001 | 2003 | 4 | 0.00000 | 4 | EM12114 |
| 1212- | 1 | 23 | 2002 | 5 | 4 0.00000 | 2003 | 5 | 4-0.00000 | 5 | EM12115 |
| 1213- | 1 | 23 | 2002 | 5 | -1.000002001 | 2003 | 5 | 1.00000 | 5 | EM12115 |
| 1214- | 1 | 23 | 2002 | 6 | 5-1.00000 | 2003 | 6 | 5 1.00000 | 6 | EM12116 |
| 1215- | 1 | 23 | 2002 | 6 | -1.000002001 | 2003 | 6 | 0.00000 | 6 | EM12116 |
| 1216- | 1 | 24 | 3002 | 1 | -1.000003001 | 3003 | 1 | 1.00000 | 1 | EM13011 |
| 1217- | 1 | 24 | 3002 | 2 | 1 1.00000 | 3003 | 2 | 1 1.00000 | 2 | EM13012 |
| 1218- | 1 | 24 | 3002 | 3 | -1.000003001 | 3003 | 3 | 2 0.00000 | 3 | EM13013 |
| 1219- | 1 | 24 | 3002 | 4 | 3 1.00000 | 3003 | 4 | 3 1.00000 | 4 | EM13014 |
| 1220- | 1 | 24 | 3002 | 5 | -1.000003001 | 3003 | 5 | 4 0.00000 | 5 | EM13015 |
| 1221- | 1 | 24 | 3002 | 6 | 5 1.00000 | 3003 | 6 | 5 1.00000 | 6 | EM13016 |
| 1222- | 1 | 25 | 3002 | 1 | -1.000003001 | 3003 | 1 | 0.00000 | 1 | EM13021 |
| 1223- | 1 | 25 | 3002 | 2 | 1 0.95105 | 3003 | 2 | 1 0.80901 | 2 | EM13022 |
| 1224- | 1 | 25 | 3002 | 3 | -1.000003001 | 3003 | 3 | 2 0.58778 | 3 | EM13023 |
| 1225- | 1 | 25 | 3002 | 4 | 2 0.30901 | 3003 | 4 | 3 0.80901 | 4 | EM13024 |
| 1226- | 1 | 25 | 3002 | 5 | -1.000003001 | 3003 | 5 | 4 0.58778 | 5 | EM13025 |
| 1227- | 1 | 25 | 3002 | 6 | 3 0.95105 | 3003 | 6 | 5 0.80901 | 6 | EM13026 |
| 1228- | 1 | 26 | 3002 | 1 | -1.000003001 | 3003 | 1 | 1.00000 | 1 | EM13031 |
| 1229- | 1 | 26 | 3002 | 2 | 1 0.80901 | 3003 | 2 | 2 0.95105 | 2 | EM13032 |
| 1230- | 1 | 26 | 3002 | 3 | -1.000003001 | 3003 | 3 | 3 0.30901 | 3 | EM13033 |
| 1231- | 1 | 26 | 3002 | 4 | 2 0.58778 | 3003 | 4 | 4 0.95105 | 4 | EM13034 |
| 1232- | 1 | 26 | 3002 | 5 | 3 0.30901 | 3003 | 5 | 5 0.30901 | 5 | EM13035 |
| 1233- | 1 | 26 | 3002 | 6 | -1.000003001 | 3003 | 6 | 5 0.30901 | 6 | EM13035 |
| 1234- | 1 | 26 | 3002 | 1 | 5 0.80901 | 3003 | 1 | 5 0.30901 | 1 | EM13035 |
| 1235- | 1 | 26 | 3002 | 2 | -1.000003001 | 3003 | 2 | 5 0.30901 | 2 | EM13035 |
| 1236- | 1 | 26 | 3002 | 3 | 2 0.95105 | 3003 | 3 | 5 0.30901 | 3 | EM13035 |
| 1237- | 1 | 26 | 3002 | 4 | -1.000003001 | 3003 | 4 | 5 0.30901 | 4 | EM13035 |
| 1238- | 1 | 26 | 3002 | 5 | 3 0.30901 | 3003 | 5 | 5 0.30901 | 5 | EM13035 |
| 1239- | 1 | 26 | 3002 | 6 | -1.000003001 | 3003 | 6 | 5 0.30901 | 6 | EM13035 |
| 1240- | 1 | 26 | 3002 | 1 | 5 0.80901 | 3003 | 1 | 5 0.30901 | 1 | EM13035 |
| 1241- | 1 | 26 | 3002 | 2 | -1.000003001 | 3003 | 2 | 5 0.30901 | 2 | EM13035 |
| 1242- | 1 | 26 | 3002 | 3 | 2 0.95105 | 3003 | 3 | 5 0.30901 | 3 | EM13035 |
| 1243- | 1 | 26 | 3002 | 4 | -1.000003001 | 3003 | 4 | 5 0.30901 | 4 | EM13035 |
| 1244- | 1 | 26 | 3002 | 5 | 3 0.30901 | 3003 | 5 | 5 0.30901 | 5 | EM13035 |
| 1245- | 1 | 26 | 3002 | 6 | -1.000003001 | 3003 | 6 | 5 0.30901 | 6 | EM13035 |
| 1246- | 1 | 26 | 3002 | 1 | 5 0.80901 | 3003 | 1 | 5 0.30901 | 1 | EM13035 |
| 1247- | 1 | 26 | 3002 | 2 | -1.000003001 | 3003 | 2 | 5 0.30901 | 2 | EM13035 |
| 1248- | 1 | 26 | 3002 | 3 | 2 0.95105 | 3003 | 3 | 5 0.30901 | 3 | EM13035 |
| 1249- | 1 | 26 | 3002 | 4 | -1.000003001 | 3003 | 4 | 5 0.30901 | 4 | EM13035 |
| 1250- | 1 | 26 | 3002 | 5 | 3 0.30901 | 3003 | 5 | 5 0.30901 | 5 | EM13035 |
| 1251- | 1 | 26 | 3002 | 6 | -1.000003001 | 3003 | 6 | 5 0.30901 | 6 | EM13035 |

SORTED BULK DATA ECHO

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---|----|------|---|-------------|------|---|-----------|---|---------|
| COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 1251- | 1 | 26 | 3002 | 6 | -1.30003001 | 3003 | 6 | .00000 | | EMI3036 |
| 1252- | 1 | 27 | 3002 | 1 | 6 0.58778 | 3003 | 1 | 1.00000 | | EMI3041 |
| 1253- | 1 | 27 | 3002 | 1 | -1.00003001 | 3003 | 1 | 1.00000 | | EMI3041 |
| 1254- | 1 | 27 | 3002 | 2 | 1 0.58778 | 3003 | 2 | 1-0.30901 | | EMI3042 |
| 1255- | 1 | 27 | 3002 | 2 | -1.00003001 | 3003 | 2 | .00000 | | EMI3042 |
| 1256- | 1 | 27 | 3002 | 3 | 2 0.58778 | 3003 | 3 | 2 0.95105 | | EMI3043 |
| 1257- | 1 | 27 | 3002 | 3 | -1.30003001 | 3003 | 3 | 1.00000 | | EMI3043 |
| 1258- | 1 | 27 | 3002 | 4 | 3 0.58778 | 3003 | 4 | 3-0.30901 | | EMI3044 |
| 1259- | 1 | 27 | 3002 | 4 | -1.30003001 | 3003 | 4 | .00000 | | EMI3044 |
| 1260- | 1 | 27 | 3002 | 5 | 4 0.58778 | 3003 | 5 | 4 0.95105 | | EMI3045 |
| 1261- | 1 | 27 | 3002 | 5 | -1.00003001 | 3003 | 5 | 1.00000 | | EMI3045 |
| 1262- | 1 | 27 | 3002 | 6 | 5 0.58778 | 3003 | 6 | 5-0.30901 | | EMI3046 |
| 1263- | 1 | 27 | 3002 | 6 | -1.00003001 | 3003 | 6 | .00000 | | EMI3046 |
| 1264- | 1 | 28 | 3002 | 1 | 6 0.80901 | 3003 | 1 | 6 0.95105 | | EMI3051 |
| 1265- | 1 | 28 | 3002 | 1 | -1.00003001 | 3003 | 1 | 1.00000 | | EMI3051 |
| 1266- | 1 | 28 | 3002 | 2 | 1 0.30901 | 3003 | 2 | 1-0.80901 | | EMI3052 |
| 1267- | 1 | 28 | 3002 | 2 | -1.00003001 | 3003 | 2 | .00000 | | EMI3052 |
| 1268- | 1 | 28 | 3002 | 3 | 2 0.95105 | 3003 | 3 | 2 0.58778 | | EMI3053 |
| 1269- | 1 | 28 | 3002 | 3 | -1.30003001 | 3003 | 3 | 1.00000 | | EMI3053 |
| 1270- | 1 | 28 | 3002 | 4 | 3 0.30901 | 3003 | 4 | 3-0.80901 | | EMI3054 |
| 1271- | 1 | 28 | 3002 | 4 | -1.00003001 | 3003 | 4 | .00000 | | EMI3054 |
| 1272- | 1 | 28 | 3002 | 5 | 4 0.95105 | 3003 | 5 | 4 0.58778 | | EMI3055 |
| 1273- | 1 | 28 | 3002 | 5 | -1.30003001 | 3003 | 5 | 1.00000 | | EMI3055 |
| 1274- | 1 | 28 | 3002 | 6 | 5 0.30901 | 3003 | 6 | 5-0.80901 | | EMI3056 |
| 1275- | 1 | 28 | 3002 | 6 | -1.30003001 | 3003 | 6 | .00000 | | EMI3056 |
| 1276- | 1 | 29 | 3002 | 1 | 6 0.95105 | 3003 | 1 | 6 0.58778 | | EMI3061 |
| 1277- | 1 | 29 | 3002 | 1 | -1.00003001 | 3003 | 1 | 1.00000 | | EMI3061 |
| 1278- | 1 | 29 | 3002 | 2 | 1 0.30901 | 3003 | 2 | 1-1.00000 | | EMI3062 |
| 1279- | 1 | 29 | 3002 | 2 | -1.30003001 | 3003 | 2 | .00000 | | EMI3062 |
| 1280- | 1 | 29 | 3002 | 3 | 2 1.30000 | 3003 | 3 | 2 0.00000 | | EMI3063 |
| 1281- | 1 | 29 | 3002 | 3 | -1.30003001 | 3003 | 3 | 1.00000 | | EMI3063 |
| 1282- | 1 | 29 | 3002 | 4 | 3 0.30901 | 3003 | 4 | 3-1.00000 | | EMI3064 |
| 1283- | 1 | 29 | 3002 | 4 | -1.30003001 | 3003 | 4 | .00000 | | EMI3064 |
| 1284- | 1 | 29 | 3002 | 5 | 4 1.30000 | 3003 | 5 | 4 0.00000 | | EMI3065 |
| 1285- | 1 | 29 | 3002 | 5 | -1.30003001 | 3003 | 5 | 1.00000 | | EMI3065 |
| 1286- | 1 | 29 | 3002 | 6 | 5 0.90000 | 3003 | 6 | 5-1.00000 | | EMI3066 |
| 1287- | 1 | 29 | 3002 | 6 | -1.30003001 | 3003 | 6 | .00000 | | EMI3066 |
| 1288- | 1 | 30 | 3002 | 1 | 6 1.30000 | 3003 | 1 | 6 0.00000 | | EMI3071 |
| 1289- | 1 | 30 | 3002 | 1 | -1.00003001 | 3003 | 1 | 1.00000 | | EMI3071 |
| 1290- | 1 | 30 | 3002 | 2 | 1-0.80901 | 3003 | 2 | 1-0.80901 | | EMI3072 |
| 1291- | 1 | 30 | 3002 | 2 | -1.30003001 | 3003 | 2 | .00000 | | EMI3072 |
| 1292- | 1 | 30 | 3002 | 3 | 2 0.95105 | 3003 | 3 | 2-0.58778 | | EMI3073 |
| 1293- | 1 | 30 | 3002 | 3 | -1.30003001 | 3003 | 3 | 1.00000 | | EMI3073 |
| 1294- | 1 | 30 | 3002 | 4 | 3-0.80901 | 3003 | 4 | 3-0.80901 | | EMI3074 |
| 1295- | 1 | 30 | 3002 | 4 | -1.00003001 | 3003 | 4 | .00000 | | EMI3074 |
| 1296- | 1 | 30 | 3002 | 5 | 4 0.95105 | 3003 | 5 | 4-0.58778 | | EMI3075 |
| 1297- | 1 | 30 | 3002 | 5 | -1.30003001 | 3003 | 5 | 1.00000 | | EMI3075 |
| 1298- | 1 | 30 | 3002 | 6 | 5-0.80901 | 3003 | 6 | 5-0.80901 | | EMI3076 |
| 1299- | 1 | 30 | 3002 | 6 | -1.30003001 | 3003 | 6 | .00000 | | EMI3076 |
| 1300- | 1 | 30 | 3002 | 6 | 6 0.95105 | 3003 | 6 | 6-0.58778 | | EMI3076 |

SORTED BULK DATA ECHO

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---------|----|------|--------------|------|--------------|------|-----------|---------|---------|
| 1301- | 1 | 31 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1302- | EM13081 | | 3002 | 1-0.00003001 | 3003 | 1-0.58778 | 3003 | 1-0.30901 | 1.00000 | EM13081 |
| 1303- | 1 | 31 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1304- | EM13082 | | 3002 | 2 0.30901 | 3003 | 2 0.30901 | 3003 | 2-0.95105 | 1.00000 | EM13082 |
| 1305- | 1 | 31 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1306- | EM13083 | | 3002 | 3-0.30901 | 3003 | 3-0.30901 | 3003 | 3-0.30901 | 1.00000 | EM13083 |
| 1307- | 1 | 31 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1308- | EM13084 | | 3002 | 4 0.30901 | 3003 | 4 0.30901 | 3003 | 4-0.95105 | 1.00000 | EM13084 |
| 1309- | 1 | 31 | 5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1310- | EM13085 | | 3002 | 5-0.58778 | 3003 | 5-0.58778 | 3003 | 5-0.30901 | 1.00000 | EM13085 |
| 1311- | 1 | 31 | 6 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1312- | EM13086 | | 3002 | 6 0.30901 | 3003 | 6 0.30901 | 3003 | 6-0.95105 | 1.00000 | EM13086 |
| 1313- | 1 | 32 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1314- | EM13091 | | 3002 | 1-0.00003001 | 3003 | 1-0.00003001 | 3003 | 1 0.30901 | 1.00000 | EM13091 |
| 1315- | 1 | 32 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1316- | EM13092 | | 3002 | 2 0.30901 | 3003 | 2 0.30901 | 3003 | 2-0.95105 | 1.00000 | EM13092 |
| 1317- | 1 | 32 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1318- | EM13093 | | 3002 | 3-0.30901 | 3003 | 3-0.30901 | 3003 | 3 0.30901 | 1.00000 | EM13093 |
| 1319- | 1 | 32 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1320- | EM13094 | | 3002 | 4 0.30901 | 3003 | 4 0.30901 | 3003 | 4-0.95105 | 1.00000 | EM13094 |
| 1321- | 1 | 32 | 5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1322- | EM13095 | | 3002 | 5-0.58778 | 3003 | 5-0.58778 | 3003 | 5 0.30901 | 1.00000 | EM13095 |
| 1323- | 1 | 32 | 6 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1324- | EM13096 | | 3002 | 6 0.30901 | 3003 | 6 0.30901 | 3003 | 6-0.95105 | 1.00000 | EM13096 |
| 1325- | 1 | 33 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1326- | EM13101 | | 3002 | 1-0.00003001 | 3003 | 1-0.00003001 | 3003 | 1 0.80901 | 1.00000 | EM13101 |
| 1327- | 1 | 33 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1328- | EM13102 | | 3002 | 2 0.30901 | 3003 | 2 0.30901 | 3003 | 2-0.58778 | 1.00000 | EM13102 |
| 1329- | 1 | 33 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1330- | EM13103 | | 3002 | 3-0.30901 | 3003 | 3-0.30901 | 3003 | 3 0.80901 | 1.00000 | EM13103 |
| 1331- | 1 | 33 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1332- | EM13104 | | 3002 | 4 0.30901 | 3003 | 4 0.30901 | 3003 | 4-0.58778 | 1.00000 | EM13104 |
| 1333- | 1 | 33 | 5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1334- | EM13105 | | 3002 | 5-0.58778 | 3003 | 5-0.58778 | 3003 | 5 0.80901 | 1.00000 | EM13105 |
| 1335- | 1 | 33 | 6 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1336- | EM13106 | | 3002 | 6 0.30901 | 3003 | 6 0.30901 | 3003 | 6-0.58778 | 1.00000 | EM13106 |
| 1337- | 1 | 34 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1338- | EM13111 | | 3002 | 1-0.00003001 | 3003 | 1-0.00003001 | 3003 | 1 1.00000 | 1.00000 | EM13111 |
| 1339- | 1 | 34 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1340- | EM13112 | | 3002 | 2 0.00000 | 3003 | 2 0.00000 | 3003 | 2-0.00000 | 1.00000 | EM13112 |
| 1341- | 1 | 34 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1342- | EM13113 | | 3002 | 3-1.00000 | 3003 | 3-1.00000 | 3003 | 3 1.00000 | 1.00000 | EM13113 |
| 1343- | 1 | 34 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1344- | EM13114 | | 3002 | 4 0.00000 | 3003 | 4 0.00000 | 3003 | 4-0.00000 | 1.00000 | EM13114 |
| 1345- | 1 | 34 | 5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1346- | EM13115 | | 3002 | 5-1.00000 | 3003 | 5-1.00000 | 3003 | 5 1.00000 | 1.00000 | EM13115 |
| 1347- | 1 | 34 | 6 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1348- | EM13116 | | 3002 | 6 0.00000 | 3003 | 6 0.00000 | 3003 | 6-0.00000 | 1.00000 | EM13116 |
| 1349- | 1 | 35 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1350- | EM14011 | | 4002 | 1 1.00000 | 4003 | 1 1.00000 | 4003 | 1 1.00000 | 1.00000 | EM14011 |

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Volume II

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| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---------|----|------|---|--------------|---|--------|---|--------|----|
| COUNT | 1 | 35 | 4002 | 2 | -1.000000001 | 2 | .00000 | 2 | .00000 | 2 |
| 1351- | MPC | | | | | | | | | 2 |
| 1352- | EM14012 | | | | | | | | | 2 |
| 1353- | MPC | | | | | | | | | 2 |
| 1354- | EM14013 | | | | | | | | | 2 |
| 1355- | MPC | | | | | | | | | 2 |
| 1356- | EM14014 | | | | | | | | | 2 |
| 1357- | MPC | | | | | | | | | 2 |
| 1358- | EM14015 | | | | | | | | | 2 |
| 1359- | MPC | | | | | | | | | 2 |
| 1360- | EM14016 | | | | | | | | | 2 |
| 1361- | MPC | | | | | | | | | 2 |
| 1362- | EM14021 | | | | | | | | | 2 |
| 1363- | MPC | | | | | | | | | 2 |
| 1364- | EM14022 | | | | | | | | | 2 |
| 1365- | MPC | | | | | | | | | 2 |
| 1366- | EM14023 | | | | | | | | | 2 |
| 1367- | MPC | | | | | | | | | 2 |
| 1368- | EM14024 | | | | | | | | | 2 |
| 1369- | MPC | | | | | | | | | 2 |
| 1370- | EM14025 | | | | | | | | | 2 |
| 1371- | MPC | | | | | | | | | 2 |
| 1372- | EM14026 | | | | | | | | | 2 |
| 1373- | MPC | | | | | | | | | 2 |
| 1374- | EM14031 | | | | | | | | | 2 |
| 1375- | MPC | | | | | | | | | 2 |
| 1376- | EM14032 | | | | | | | | | 2 |
| 1377- | MPC | | | | | | | | | 2 |
| 1378- | EM14033 | | | | | | | | | 2 |
| 1379- | MPC | | | | | | | | | 2 |
| 1380- | EM14034 | | | | | | | | | 2 |
| 1381- | MPC | | | | | | | | | 2 |
| 1382- | EM14035 | | | | | | | | | 2 |
| 1383- | MPC | | | | | | | | | 2 |
| 1384- | EM14036 | | | | | | | | | 2 |
| 1385- | MPC | | | | | | | | | 2 |
| 1386- | EM14041 | | | | | | | | | 2 |
| 1387- | MPC | | | | | | | | | 2 |
| 1388- | EM14042 | | | | | | | | | 2 |
| 1389- | MPC | | | | | | | | | 2 |
| 1390- | EM14043 | | | | | | | | | 2 |
| 1391- | MPC | | | | | | | | | 2 |
| 1392- | EM14044 | | | | | | | | | 2 |
| 1393- | MPC | | | | | | | | | 2 |
| 1394- | EM14045 | | | | | | | | | 2 |
| 1395- | MPC | | | | | | | | | 2 |
| 1396- | EM14046 | | | | | | | | | 2 |
| 1397- | MPC | | | | | | | | | 2 |
| 1398- | EM14051 | | | | | | | | | 2 |
| 1399- | MPC | | | | | | | | | 2 |
| 1400- | EM14052 | | | | | | | | | 2 |

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---|----|------|---|--------------|------|---|-----------|---|---------|
| COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 1401- | 1 | 39 | 4002 | 3 | -1.000004001 | 4003 | 3 | 1.00000 | | EM14053 |
| 1402- | 1 | 39 | 4002 | 4 | 3 0.30901 | 4003 | 4 | 3-0.80901 | | EM14054 |
| 1403- | 1 | 39 | 4002 | 5 | -1.000004001 | 4003 | 5 | .00000 | | EM14055 |
| 1404- | 1 | 39 | 4002 | 6 | 4 0.95105 | 4003 | 6 | 4 0.58778 | | EM14056 |
| 1405- | 1 | 39 | 4002 | 7 | -1.000004001 | 4003 | 7 | 1.00000 | | EM14057 |
| 1406- | 1 | 39 | 4002 | 8 | 5 0.30901 | 4003 | 8 | 5-0.80901 | | EM14058 |
| 1407- | 1 | 39 | 4002 | 9 | -1.000004001 | 4003 | 9 | .00000 | | EM14059 |
| 1408- | 1 | 40 | 4002 | 1 | 6 0.95105 | 4003 | 1 | 6 0.58778 | | EM14060 |
| 1409- | 1 | 40 | 4002 | 2 | -1.000004001 | 4003 | 2 | 1.00000 | | EM14061 |
| 1410- | 1 | 40 | 4002 | 3 | 1 0.00000 | 4003 | 3 | 1-1.00000 | | EM14062 |
| 1411- | 1 | 40 | 4002 | 4 | -1.000004001 | 4003 | 4 | .00000 | | EM14063 |
| 1412- | 1 | 40 | 4002 | 5 | 2 1.00000 | 4003 | 5 | 2 0.00000 | | EM14064 |
| 1413- | 1 | 40 | 4002 | 6 | -1.000004001 | 4003 | 6 | 3-1.00000 | | EM14065 |
| 1414- | 1 | 40 | 4002 | 7 | 3 0.00000 | 4003 | 7 | .00000 | | EM14066 |
| 1415- | 1 | 40 | 4002 | 8 | -1.000004001 | 4003 | 8 | 4 0.00000 | | EM14067 |
| 1416- | 1 | 40 | 4002 | 9 | 4 1.00000 | 4003 | 9 | 4 0.00000 | | EM14068 |
| 1417- | 1 | 40 | 4002 | 1 | -1.000004001 | 4003 | 1 | 1.00000 | | EM14069 |
| 1418- | 1 | 40 | 4002 | 2 | -1.000004001 | 4003 | 2 | 5-1.00000 | | EM14070 |
| 1419- | 1 | 40 | 4002 | 3 | 5 0.00000 | 4003 | 3 | .00000 | | EM14071 |
| 1420- | 1 | 40 | 4002 | 4 | -1.000004001 | 4003 | 4 | 6 0.00000 | | EM14072 |
| 1421- | 1 | 41 | 4002 | 1 | 6 1.00000 | 4003 | 1 | 3-0.80901 | | EM14073 |
| 1422- | 1 | 41 | 4002 | 2 | -1.000004001 | 4003 | 2 | .00000 | | EM14074 |
| 1423- | 1 | 41 | 4002 | 3 | 1-0.30901 | 4003 | 3 | 4-0.58778 | | EM14075 |
| 1424- | 1 | 41 | 4002 | 4 | -1.000004001 | 4003 | 4 | 1.00000 | | EM14076 |
| 1425- | 1 | 41 | 4002 | 5 | 2 0.95105 | 4003 | 5 | 6-0.58778 | | EM14077 |
| 1426- | 1 | 41 | 4002 | 6 | -1.000004001 | 4003 | 6 | 1.00000 | | EM14078 |
| 1427- | 1 | 41 | 4002 | 7 | 3-0.30901 | 4003 | 7 | 3-0.80901 | | EM14079 |
| 1428- | 1 | 41 | 4002 | 8 | -1.000004001 | 4003 | 8 | .00000 | | EM14080 |
| 1429- | 1 | 41 | 4002 | 9 | 4 0.95105 | 4003 | 9 | 4-0.58778 | | EM14081 |
| 1430- | 1 | 41 | 4002 | 1 | -1.000004001 | 4003 | 1 | 1.00000 | | EM14082 |
| 1431- | 1 | 41 | 4002 | 2 | 5-0.30901 | 4003 | 2 | 5-0.80901 | | EM14083 |
| 1432- | 1 | 41 | 4002 | 3 | -1.000004001 | 4003 | 3 | .00000 | | EM14084 |
| 1433- | 1 | 42 | 4002 | 1 | 6 0.95105 | 4003 | 1 | 6-0.58778 | | EM14085 |
| 1434- | 1 | 42 | 4002 | 2 | -1.000004001 | 4003 | 2 | 1.00000 | | EM14086 |
| 1435- | 1 | 42 | 4002 | 3 | 1-0.58778 | 4003 | 3 | 1-0.30901 | | EM14087 |
| 1436- | 1 | 42 | 4002 | 4 | -1.000004001 | 4003 | 4 | .00000 | | EM14088 |
| 1437- | 1 | 42 | 4002 | 5 | 2 0.95105 | 4003 | 5 | 2-0.95105 | | EM14089 |
| 1438- | 1 | 42 | 4002 | 6 | -1.000004001 | 4003 | 6 | 1.00000 | | EM14090 |
| 1439- | 1 | 42 | 4002 | 7 | 3-0.30901 | 4003 | 7 | 3-0.80901 | | EM14091 |
| 1440- | 1 | 42 | 4002 | 8 | -1.000004001 | 4003 | 8 | .00000 | | EM14092 |
| 1441- | 1 | 42 | 4002 | 9 | 4 0.95105 | 4003 | 9 | 4-0.95105 | | EM14093 |
| 1442- | 1 | 42 | 4002 | 1 | -1.000004001 | 4003 | 1 | 1.00000 | | EM14094 |
| 1443- | 1 | 42 | 4002 | 2 | 5-0.30901 | 4003 | 2 | 5-0.80901 | | EM14095 |
| 1444- | 1 | 42 | 4002 | 3 | -1.000004001 | 4003 | 3 | .00000 | | EM14096 |
| 1445- | 1 | 42 | 4002 | 4 | 6 0.95105 | 4003 | 4 | 6-0.95105 | | EM14097 |
| 1446- | 1 | 43 | 4002 | 1 | -1.000004001 | 4003 | 1 | 1.00000 | | EM14098 |
| 1447- | 1 | 43 | 4002 | 2 | 1-0.30901 | 4003 | 2 | 1-0.30901 | | EM14099 |
| 1448- | 1 | 43 | 4002 | 3 | -1.000004001 | 4003 | 3 | .00000 | | EM14100 |
| 1449- | 1 | 43 | 4002 | 4 | 2 0.95105 | 4003 | 4 | 2-0.95105 | | EM14101 |
| 1450- | 1 | 43 | 4002 | 5 | -1.000004001 | 4003 | 5 | 1.00000 | | EM14102 |

SORTED BULK DATA ECHO

| CARD
COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------------|---|----|------|---|----------------|------|--------|-----------|---------|----|
| 1451- | 1 | 43 | 4 | 4 | -1.000004001 | 4 | .00000 | .00000 | EM14094 | |
| 1452- | 1 | 43 | 4002 | 4 | 0.58778 | 4003 | 4 | 0.95105 | EM14095 | |
| 1453- | 1 | 43 | 4002 | 5 | -1.000004001 | 4003 | 5 | 1.00000 | EM14095 | |
| 1454- | 1 | 43 | 4002 | 5 | 0.30901 | 4003 | 5 | 0.30901 | EM14096 | |
| 1455- | 1 | 43 | 4002 | 6 | -1.000004001 | 4003 | 6 | .00000 | EM14096 | |
| 1456- | 1 | 43 | 4002 | 6 | 0.58778 | 4003 | 6 | 0.95105 | EM14101 | |
| 1457- | 1 | 44 | 4002 | 1 | -1.000004001 | 4003 | 1 | 1.00000 | EM14101 | |
| 1458- | 1 | 44 | 4002 | 2 | 1.000004001 | 4003 | 2 | 0.80901 | EM14102 | |
| 1459- | 1 | 44 | 4002 | 2 | -1.000004001 | 4003 | 2 | .00000 | EM14102 | |
| 1460- | 1 | 44 | 4002 | 3 | 2.0.30901 | 4003 | 3 | 2.0.58778 | EM14103 | |
| 1461- | 1 | 44 | 4002 | 3 | -1.000004001 | 4003 | 3 | 1.00000 | EM14103 | |
| 1462- | 1 | 44 | 4002 | 4 | 3.0.95105 | 4003 | 4 | 3.0.80301 | EM14104 | |
| 1463- | 1 | 44 | 4002 | 4 | -1.000004001 | 4003 | 4 | .00000 | EM14104 | |
| 1464- | 1 | 44 | 4002 | 5 | 4.0.30901 | 4003 | 5 | 4.0.58778 | EM14105 | |
| 1465- | 1 | 44 | 4002 | 5 | -1.000004001 | 4003 | 5 | 1.00000 | EM14105 | |
| 1466- | 1 | 44 | 4002 | 6 | 5.0.95105 | 4003 | 6 | 5.0.80901 | EM14106 | |
| 1467- | 1 | 44 | 4002 | 6 | -1.000004001 | 4003 | 6 | .00000 | EM14106 | |
| 1468- | 1 | 45 | 4002 | 1 | 6.0.30901 | 4003 | 1 | 6.0.58778 | EM14111 | |
| 1469- | 1 | 45 | 4002 | 1 | -1.000004001 | 4003 | 1 | 1.00000 | EM14111 | |
| 1470- | 1 | 45 | 4002 | 2 | 1.1.00000 | 4003 | 2 | 1.1.00000 | EM14112 | |
| 1471- | 1 | 45 | 4002 | 2 | -1.1.000004001 | 4003 | 2 | .00000 | EM14112 | |
| 1472- | 1 | 45 | 4002 | 3 | 2.0.30000 | 4003 | 3 | 2.0.00000 | EM14113 | |
| 1473- | 1 | 45 | 4002 | 3 | -1.1.000004001 | 4003 | 3 | 1.00000 | EM14113 | |
| 1474- | 1 | 45 | 4002 | 4 | 3.1.00000 | 4003 | 4 | 3.1.00000 | EM14114 | |
| 1475- | 1 | 45 | 4002 | 4 | -1.000004001 | 4003 | 4 | .00000 | EM14114 | |
| 1476- | 1 | 45 | 4002 | 5 | 4.0.00000 | 4003 | 5 | 4.0.00000 | EM14115 | |
| 1477- | 1 | 45 | 4002 | 5 | -1.1.000004001 | 4003 | 5 | 1.00000 | EM14115 | |
| 1478- | 1 | 45 | 4002 | 6 | 5.1.00000 | 4003 | 6 | 5.1.00000 | EM14116 | |
| 1479- | 1 | 45 | 4002 | 6 | -1.000004001 | 4003 | 6 | .00000 | EM14116 | |
| 1480- | 1 | 46 | 5002 | 1 | 6.0.00000 | 5003 | 1 | 6.0.00000 | EM15011 | |
| 1481- | 1 | 46 | 5002 | 1 | -1.000005001 | 5003 | 1 | 1.00000 | EM15011 | |
| 1482- | 1 | 46 | 5002 | 2 | 1.1.00000 | 5003 | 2 | 1.1.00000 | EM15012 | |
| 1483- | 1 | 46 | 5002 | 2 | -1.000005001 | 5003 | 2 | .00000 | EM15012 | |
| 1484- | 1 | 46 | 5002 | 3 | 2.0.00000 | 5003 | 3 | 2.0.00000 | EM15013 | |
| 1485- | 1 | 46 | 5002 | 3 | -1.1.000005001 | 5003 | 3 | 1.00000 | EM15013 | |
| 1486- | 1 | 46 | 5002 | 4 | 3.1.00000 | 5003 | 4 | 3.1.00000 | EM15014 | |
| 1487- | 1 | 46 | 5002 | 4 | -1.000005001 | 5003 | 4 | .00000 | EM15014 | |
| 1488- | 1 | 46 | 5002 | 5 | 4.0.00000 | 5003 | 5 | 4.0.00000 | EM15015 | |
| 1489- | 1 | 46 | 5002 | 5 | -1.000005001 | 5003 | 5 | 1.00000 | EM15015 | |
| 1490- | 1 | 46 | 5002 | 6 | 5.1.00000 | 5003 | 6 | 5.1.00000 | EM15016 | |
| 1491- | 1 | 46 | 5002 | 6 | -1.000005001 | 5003 | 6 | .00000 | EM15016 | |
| 1492- | 1 | 47 | 5002 | 1 | 6.0.00000 | 5003 | 1 | 6.0.00000 | EM15021 | |
| 1493- | 1 | 47 | 5002 | 1 | -1.000005001 | 5003 | 1 | 1.00000 | EM15021 | |
| 1494- | 1 | 47 | 5002 | 2 | 1.0.95105 | 5003 | 2 | 1.0.80901 | EM15022 | |
| 1495- | 1 | 47 | 5002 | 2 | -1.000005001 | 5003 | 2 | .00000 | EM15022 | |
| 1496- | 1 | 47 | 5002 | 3 | 2.0.30901 | 5003 | 3 | 2.0.58778 | EM15023 | |
| 1497- | 1 | 47 | 5002 | 3 | -1.000005001 | 5003 | 3 | 1.00000 | EM15023 | |
| 1498- | 1 | 47 | 5002 | 4 | 3.0.95105 | 5003 | 4 | 3.0.80901 | EM15024 | |
| 1499- | 1 | 47 | 5002 | 4 | -1.000005001 | 5003 | 4 | .00000 | EM15024 | |
| 1500- | 1 | 47 | 5002 | 5 | 4.0.30901 | 5003 | 5 | 4.0.58778 | EM15025 | |

SORTED BULK DATA ECHO

| CARD
COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------------|---|----|------|---|--------------|---|---------|---|---------|---------|
| 1501- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15025 |
| 1502- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15026 |
| 1503- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15027 |
| 1504- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15028 |
| 1505- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15029 |
| 1506- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15030 |
| 1507- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15031 |
| 1508- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15032 |
| 1509- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15033 |
| 1510- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15034 |
| 1511- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15035 |
| 1512- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15036 |
| 1513- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15037 |
| 1514- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15038 |
| 1515- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15039 |
| 1516- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15040 |
| 1517- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15041 |
| 1518- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15042 |
| 1519- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15043 |
| 1520- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15044 |
| 1521- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15045 |
| 1522- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15046 |
| 1523- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15047 |
| 1524- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15048 |
| 1525- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15049 |
| 1526- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15050 |
| 1527- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15051 |
| 1528- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15052 |
| 1529- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15053 |
| 1530- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15054 |
| 1531- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15055 |
| 1532- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15056 |
| 1533- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15057 |
| 1534- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15058 |
| 1535- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15059 |
| 1536- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15060 |
| 1537- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15061 |
| 1538- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15062 |
| 1539- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15063 |
| 1540- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15064 |
| 1541- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15065 |
| 1542- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15066 |
| 1543- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15067 |
| 1544- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15068 |
| 1545- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15069 |
| 1546- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15070 |
| 1547- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15071 |
| 1548- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15072 |
| 1549- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15073 |
| 1550- | 1 | 47 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 5 | 0.80901 | EM15074 |

ORIGINAL PAGE IS
OF POOR QUALITY

SORTED BULK DATA ECPD

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---|----|------|---|--------------|---|---|-----------|---|---------|
| 1551- | 1 | 51 | 5002 | 6 | -1.000005001 | 6 | | .00000 | | EM15066 |
| 1552- | 1 | 52 | 5002 | 1 | -1.000005001 | 1 | | 1.00000 | | EM15071 |
| 1553- | 1 | 52 | 5002 | 1 | -1.000005001 | 1 | | 1.00000 | | EM15072 |
| 1554- | 1 | 52 | 5002 | 2 | -1.000005001 | 2 | | 2-0.58778 | | EM15073 |
| 1555- | 1 | 52 | 5002 | 3 | -1.000005001 | 3 | | 3-0.80901 | | EM15074 |
| 1556- | 1 | 52 | 5002 | 4 | -1.000005001 | 4 | | 4-0.95105 | | EM15075 |
| 1557- | 1 | 52 | 5002 | 5 | -1.000005001 | 5 | | 5-0.80901 | | EM15076 |
| 1558- | 1 | 52 | 5002 | 6 | -1.000005001 | 6 | | 6-0.58778 | | EM15081 |
| 1559- | 1 | 53 | 5002 | 1 | -1.000005001 | 1 | | 1.00000 | | EM15082 |
| 1560- | 1 | 53 | 5002 | 2 | -1.000005001 | 2 | | 2-0.95105 | | EM15083 |
| 1561- | 1 | 53 | 5002 | 3 | -1.000005001 | 3 | | 3-0.30901 | | EM15084 |
| 1562- | 1 | 53 | 5002 | 4 | -1.000005001 | 4 | | 4-0.95105 | | EM15085 |
| 1563- | 1 | 53 | 5002 | 5 | -1.000005001 | 5 | | 5-0.70901 | | EM15086 |
| 1564- | 1 | 53 | 5002 | 6 | -1.000005001 | 6 | | 6-0.95105 | | EM15091 |
| 1565- | 1 | 54 | 5002 | 1 | -1.000005001 | 1 | | 1.00000 | | EM15092 |
| 1566- | 1 | 54 | 5002 | 2 | -1.000005001 | 2 | | 2-0.95105 | | EM15093 |
| 1567- | 1 | 54 | 5002 | 3 | -1.000005001 | 3 | | 3 0.30901 | | EM15094 |
| 1568- | 1 | 54 | 5002 | 4 | -1.000005001 | 4 | | 4-0.95105 | | EM15095 |
| 1569- | 1 | 54 | 5002 | 5 | -1.000005001 | 5 | | 5 0.30901 | | EM15096 |
| 1570- | 1 | 54 | 5002 | 6 | -1.000005001 | 6 | | 6-0.95105 | | EM15101 |
| 1571- | 1 | 55 | 5002 | 1 | -1.000005001 | 1 | | 1.00000 | | EM15102 |
| 1572- | 1 | 55 | 5002 | 2 | -1.000005001 | 2 | | 2-0.58778 | | EM15103 |
| 1573- | 1 | 55 | 5002 | 3 | -1.000005001 | 3 | | 3 0.80901 | | EM15104 |
| 1574- | 1 | 55 | 5002 | 4 | -1.000005001 | 4 | | 4-0.58778 | | EM15105 |
| 1575- | 1 | 55 | 5002 | 5 | -1.000005001 | 5 | | 5 0.80901 | | EM15106 |
| 1576- | 1 | 55 | 5002 | 6 | -1.000005001 | 6 | | 6-0.58778 | | |
| 1577- | 1 | 55 | 5002 | 1 | -1.000005001 | 1 | | 1.00000 | | |
| 1578- | 1 | 55 | 5002 | 2 | -1.000005001 | 2 | | 2-0.95105 | | |
| 1579- | 1 | 55 | 5002 | 3 | -1.000005001 | 3 | | 3 0.30901 | | |
| 1580- | 1 | 55 | 5002 | 4 | -1.000005001 | 4 | | 4-0.95105 | | |
| 1581- | 1 | 55 | 5002 | 5 | -1.000005001 | 5 | | 5 0.30901 | | |
| 1582- | 1 | 55 | 5002 | 6 | -1.000005001 | 6 | | 6-0.95105 | | |
| 1583- | 1 | 55 | 5002 | 1 | -1.000005001 | 1 | | 1.00000 | | |
| 1584- | 1 | 55 | 5002 | 2 | -1.000005001 | 2 | | 2-0.58778 | | |
| 1585- | 1 | 55 | 5002 | 3 | -1.000005001 | 3 | | 3 0.80901 | | |
| 1586- | 1 | 55 | 5002 | 4 | -1.000005001 | 4 | | 4-0.58778 | | |
| 1587- | 1 | 55 | 5002 | 5 | -1.000005001 | 5 | | 5 0.80901 | | |
| 1588- | 1 | 55 | 5002 | 6 | -1.000005001 | 6 | | 6-0.58778 | | |
| 1589- | 1 | 55 | 5002 | 1 | -1.000005001 | 1 | | 1.00000 | | |
| 1590- | 1 | 55 | 5002 | 2 | -1.000005001 | 2 | | 2-0.95105 | | |
| 1591- | 1 | 55 | 5002 | 3 | -1.000005001 | 3 | | 3 0.30901 | | |
| 1592- | 1 | 55 | 5002 | 4 | -1.000005001 | 4 | | 4-0.95105 | | |
| 1593- | 1 | 55 | 5002 | 5 | -1.000005001 | 5 | | 5 0.30901 | | |
| 1594- | 1 | 55 | 5002 | 6 | -1.000005001 | 6 | | 6-0.95105 | | |
| 1595- | 1 | 55 | 5002 | 1 | -1.000005001 | 1 | | 1.00000 | | |
| 1596- | 1 | 55 | 5002 | 2 | -1.000005001 | 2 | | 2-0.58778 | | |
| 1597- | 1 | 55 | 5002 | 3 | -1.000005001 | 3 | | 3 0.80901 | | |
| 1598- | 1 | 55 | 5002 | 4 | -1.000005001 | 4 | | 4-0.58778 | | |
| 1599- | 1 | 55 | 5002 | 5 | -1.000005001 | 5 | | 5 0.80901 | | |
| 1600- | 1 | 55 | 5002 | 6 | -1.000005001 | 6 | | 6-0.58778 | | |

MAY 4. 1974 NASTRAN 5/13/72

AXI METRIC CIRC. CYL. WITH FLUID
HARMONIC REDUCTION

SORTED PULK DATA ECHD

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---|----|------|---|--------------|---|---------|---------|---------|----|
| 1601- | 1 | 56 | 5002 | 1 | -1.000005001 | 1 | 1.00000 | 1.00000 | EM15111 | |
| 1602- | 1 | 56 | 5002 | 2 | -1.000005001 | 2 | 1.00000 | 1.00000 | EM15112 | |
| 1603- | 1 | 56 | 5002 | 3 | -1.000005001 | 3 | 1.00000 | 1.00000 | EM15113 | |
| 1604- | 1 | 56 | 5002 | 4 | -1.000005001 | 4 | 1.00000 | 1.00000 | EM15114 | |
| 1605- | 1 | 56 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 1.00000 | EM15115 | |
| 1606- | 1 | 56 | 5002 | 6 | -1.000005001 | 6 | 1.00000 | 1.00000 | EM15116 | |
| 1607- | 1 | 56 | 5002 | 1 | -1.000005001 | 1 | 1.00000 | 1.00000 | EM16011 | |
| 1608- | 1 | 56 | 5002 | 2 | -1.000005001 | 2 | 1.00000 | 1.00000 | EM16012 | |
| 1609- | 1 | 56 | 5002 | 3 | -1.000005001 | 3 | 1.00000 | 1.00000 | EM16013 | |
| 1610- | 1 | 56 | 5002 | 4 | -1.000005001 | 4 | 1.00000 | 1.00000 | EM16014 | |
| 1611- | 1 | 56 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 1.00000 | EM16015 | |
| 1612- | 1 | 56 | 5002 | 6 | -1.000005001 | 6 | 1.00000 | 1.00000 | EM16016 | |
| 1613- | 1 | 56 | 5002 | 1 | -1.000005001 | 1 | 1.00000 | 1.00000 | EM16021 | |
| 1614- | 1 | 56 | 5002 | 2 | -1.000005001 | 2 | 1.00000 | 1.00000 | EM16022 | |
| 1615- | 1 | 56 | 5002 | 3 | -1.000005001 | 3 | 1.00000 | 1.00000 | EM16023 | |
| 1616- | 1 | 56 | 5002 | 4 | -1.000005001 | 4 | 1.00000 | 1.00000 | EM16024 | |
| 1617- | 1 | 56 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 1.00000 | EM16025 | |
| 1618- | 1 | 56 | 5002 | 6 | -1.000005001 | 6 | 1.00000 | 1.00000 | EM16026 | |
| 1619- | 1 | 56 | 5002 | 1 | -1.000005001 | 1 | 1.00000 | 1.00000 | EM16031 | |
| 1620- | 1 | 56 | 5002 | 2 | -1.000005001 | 2 | 1.00000 | 1.00000 | EM16032 | |
| 1621- | 1 | 56 | 5002 | 3 | -1.000005001 | 3 | 1.00000 | 1.00000 | EM16033 | |
| 1622- | 1 | 56 | 5002 | 4 | -1.000005001 | 4 | 1.00000 | 1.00000 | EM16034 | |
| 1623- | 1 | 56 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 1.00000 | EM16035 | |
| 1624- | 1 | 56 | 5002 | 6 | -1.000005001 | 6 | 1.00000 | 1.00000 | EM16036 | |
| 1625- | 1 | 56 | 5002 | 1 | -1.000005001 | 1 | 1.00000 | 1.00000 | EM16041 | |
| 1626- | 1 | 56 | 5002 | 2 | -1.000005001 | 2 | 1.00000 | 1.00000 | EM16041 | |
| 1627- | 1 | 56 | 5002 | 3 | -1.000005001 | 3 | 1.00000 | 1.00000 | EM16041 | |
| 1628- | 1 | 56 | 5002 | 4 | -1.000005001 | 4 | 1.00000 | 1.00000 | EM16041 | |
| 1629- | 1 | 56 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 1.00000 | EM16041 | |
| 1630- | 1 | 56 | 5002 | 6 | -1.000005001 | 6 | 1.00000 | 1.00000 | EM16041 | |
| 1631- | 1 | 56 | 5002 | 1 | -1.000005001 | 1 | 1.00000 | 1.00000 | EM16041 | |
| 1632- | 1 | 56 | 5002 | 2 | -1.000005001 | 2 | 1.00000 | 1.00000 | EM16041 | |
| 1633- | 1 | 56 | 5002 | 3 | -1.000005001 | 3 | 1.00000 | 1.00000 | EM16041 | |
| 1634- | 1 | 56 | 5002 | 4 | -1.000005001 | 4 | 1.00000 | 1.00000 | EM16041 | |
| 1635- | 1 | 56 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 1.00000 | EM16041 | |
| 1636- | 1 | 56 | 5002 | 6 | -1.000005001 | 6 | 1.00000 | 1.00000 | EM16041 | |
| 1637- | 1 | 56 | 5002 | 1 | -1.000005001 | 1 | 1.00000 | 1.00000 | EM16041 | |
| 1638- | 1 | 56 | 5002 | 2 | -1.000005001 | 2 | 1.00000 | 1.00000 | EM16041 | |
| 1639- | 1 | 56 | 5002 | 3 | -1.000005001 | 3 | 1.00000 | 1.00000 | EM16041 | |
| 1640- | 1 | 56 | 5002 | 4 | -1.000005001 | 4 | 1.00000 | 1.00000 | EM16041 | |
| 1641- | 1 | 56 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 1.00000 | EM16041 | |
| 1642- | 1 | 56 | 5002 | 6 | -1.000005001 | 6 | 1.00000 | 1.00000 | EM16041 | |
| 1643- | 1 | 56 | 5002 | 1 | -1.000005001 | 1 | 1.00000 | 1.00000 | EM16041 | |
| 1644- | 1 | 56 | 5002 | 2 | -1.000005001 | 2 | 1.00000 | 1.00000 | EM16041 | |
| 1645- | 1 | 56 | 5002 | 3 | -1.000005001 | 3 | 1.00000 | 1.00000 | EM16041 | |
| 1646- | 1 | 56 | 5002 | 4 | -1.000005001 | 4 | 1.00000 | 1.00000 | EM16041 | |
| 1647- | 1 | 56 | 5002 | 5 | -1.000005001 | 5 | 1.00000 | 1.00000 | EM16041 | |
| 1648- | 1 | 56 | 5002 | 6 | -1.000005001 | 6 | 1.00000 | 1.00000 | EM16041 | |
| 1649- | 1 | 56 | 5002 | 1 | -1.000005001 | 1 | 1.00000 | 1.00000 | EM16041 | |
| 1650- | 1 | 56 | 5002 | 2 | -1.000005001 | 2 | 1.00000 | 1.00000 | EM16041 | |

ORIGINAL PAGE IS
OF POOR QUALITY

AXISYMMETRIC CIRC. CYL. WITH FLOW
HARMONIC REDUCTION

| SORTED BULK DATA ECHO | | | | | | | | | | |
|-----------------------|---------|----|------|---|--------------|------|---------|----------|---|---------|
| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 1651- | 1 | 60 | 2 | 2 | -1.000000001 | 2 | .00000 | | | EM16042 |
| 1652- | EM16042 | | 6002 | 2 | 0.000000001 | 6003 | 2 | 0.95105 | | |
| 1653- | MPC | 1 | 60 | 3 | -1.000000001 | 3 | 1.00000 | | | EM16043 |
| 1654- | EM16043 | | 6002 | 3 | 0.58778 | 6003 | 3 | -0.30901 | | |
| 1655- | MPC | 1 | 60 | 4 | -1.000000001 | 4 | .00000 | | | EM16044 |
| 1656- | EM16044 | | 6002 | 4 | 0.000000001 | 6003 | 4 | 0.95105 | | |
| 1657- | MPC | 1 | 60 | 5 | -1.000000001 | 5 | 1.00000 | | | EM16045 |
| 1658- | EM16045 | | 6002 | 5 | 0.58778 | 6003 | 5 | -0.30901 | | |
| 1659- | MPC | 1 | 60 | 6 | -1.000000001 | 6 | .00000 | | | EM16046 |
| 1660- | EM16046 | | 6002 | 6 | 0.000000001 | 6003 | 6 | 0.95105 | | |
| 1661- | MPC | 1 | 61 | 1 | -1.000000001 | 1 | 1.00000 | | | EM16051 |
| 1662- | EM16051 | | 6002 | 1 | 0.30901 | 6003 | 1 | 0.80901 | | |
| 1663- | MPC | 1 | 61 | 2 | -1.000000001 | 2 | .00000 | | | EM16052 |
| 1664- | EM16052 | | 6002 | 2 | 0.95105 | 6003 | 2 | 0.58778 | | |
| 1665- | MPC | 1 | 61 | 3 | -1.000000001 | 3 | 1.00000 | | | EM16053 |
| 1666- | EM16053 | | 6002 | 3 | 0.000000001 | 6003 | 3 | -0.80901 | | |
| 1667- | MPC | 1 | 61 | 4 | -1.000000001 | 4 | .00000 | | | EM16054 |
| 1668- | EM16054 | | 6002 | 4 | 0.95105 | 6003 | 4 | 0.58778 | | |
| 1669- | MPC | 1 | 61 | 5 | -1.000000001 | 5 | 1.00000 | | | EM16055 |
| 1670- | EM16055 | | 6002 | 5 | 0.30901 | 6003 | 5 | -0.80901 | | |
| 1671- | MPC | 1 | 61 | 6 | -1.000000001 | 6 | .00000 | | | EM16056 |
| 1672- | EM16056 | | 6002 | 6 | 0.95105 | 6003 | 6 | 0.58778 | | |
| 1673- | MPC | 1 | 62 | 1 | -1.000000001 | 1 | 1.00000 | | | EM16061 |
| 1674- | EM16061 | | 6002 | 1 | 0.000000001 | 6003 | 1 | -1.00000 | | |
| 1675- | MPC | 1 | 62 | 2 | -1.000000001 | 2 | .00000 | | | EM16062 |
| 1676- | EM16062 | | 6002 | 2 | 0.000000001 | 6003 | 2 | 0.00000 | | |
| 1677- | MPC | 1 | 62 | 3 | -1.000000001 | 3 | 1.00000 | | | EM16063 |
| 1678- | EM16063 | | 6002 | 3 | 0.30901 | 6003 | 3 | -1.00000 | | |
| 1679- | MPC | 1 | 62 | 4 | -1.000000001 | 4 | .00000 | | | EM16064 |
| 1680- | EM16064 | | 6002 | 4 | 0.000000001 | 6003 | 4 | 0.00000 | | |
| 1681- | MPC | 1 | 62 | 5 | -1.000000001 | 5 | 1.00000 | | | EM16065 |
| 1682- | EM16065 | | 6002 | 5 | 0.000000001 | 6003 | 5 | -1.00000 | | |
| 1683- | MPC | 1 | 62 | 6 | -1.000000001 | 6 | .00000 | | | EM16066 |
| 1684- | EM16066 | | 6002 | 6 | 0.000000001 | 6003 | 6 | 0.00000 | | |
| 1685- | MPC | 1 | 63 | 1 | -1.000000001 | 1 | 1.00000 | | | EM16071 |
| 1686- | EM16071 | | 6002 | 1 | 0.30901 | 6003 | 1 | 0.80901 | | |
| 1687- | MPC | 1 | 63 | 2 | -1.000000001 | 2 | .00000 | | | EM16072 |
| 1688- | EM16072 | | 6002 | 2 | 0.95105 | 6003 | 2 | 0.58778 | | |
| 1689- | MPC | 1 | 63 | 3 | -1.000000001 | 3 | 1.00000 | | | EM16073 |
| 1690- | EM16073 | | 6002 | 3 | 0.30901 | 6003 | 3 | -0.80901 | | |
| 1691- | MPC | 1 | 63 | 4 | -1.000000001 | 4 | .00000 | | | EM16074 |
| 1692- | EM16074 | | 6002 | 4 | 0.000000001 | 6003 | 4 | -0.58778 | | |
| 1693- | MPC | 1 | 63 | 5 | -1.000000001 | 5 | 1.00000 | | | EM16075 |
| 1694- | EM16075 | | 6002 | 5 | 0.000000001 | 6003 | 5 | -0.80901 | | |
| 1695- | MPC | 1 | 63 | 6 | -1.000000001 | 6 | .00000 | | | EM16076 |
| 1696- | EM16076 | | 6002 | 6 | 0.95105 | 6003 | 6 | 0.58778 | | |
| 1697- | MPC | 1 | 64 | 1 | -1.000000001 | 1 | 1.00000 | | | EM16081 |
| 1698- | EM16081 | | 6002 | 1 | 0.30901 | 6003 | 1 | 0.80901 | | |
| 1699- | MPC | 1 | 64 | 2 | -1.000000001 | 2 | .00000 | | | EM16082 |
| 1700- | EM16082 | | 6002 | 2 | 0.000000001 | 6003 | 2 | -0.95105 | | |

MAY 4, 1974 NASTRAN 5/13/72

AXISYMMETRIC CIRC. CYL. WITH FLUID
HARMONIC REDUCTION

| SORTED BULK DATA ECHO | | | | | | | | | |
|-----------------------|---|----|------|---|-------------|------|-----------|---|---------|
| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 1701- | 1 | 64 | 3 | 3 | -1.00000001 | 3 | 1.00000 | 9 | 10 |
| 1702- | 1 | 64 | 6002 | 3 | 3-0.58778 | 6003 | 3-0.30901 | | EM16083 |
| 1703- | 1 | 64 | 6002 | 4 | -1.00000001 | 6003 | .00000 | | EM16084 |
| 1704- | 1 | 64 | 6002 | 5 | -1.00000001 | 6003 | 4-0.95105 | | EM16085 |
| 1705- | 1 | 64 | 6002 | 6 | -1.00000001 | 6003 | 5-0.30901 | | EM16086 |
| 1706- | 1 | 64 | 6002 | 1 | -1.00000001 | 6003 | .00000 | | EM16087 |
| 1707- | 1 | 64 | 6002 | 2 | -1.00000001 | 6003 | 6-0.95105 | | EM16088 |
| 1708- | 1 | 64 | 6002 | 3 | -1.00000001 | 6003 | 1 0.30901 | | EM16089 |
| 1709- | 1 | 64 | 6002 | 4 | -1.00000001 | 6003 | .00000 | | EM16090 |
| 1710- | 1 | 64 | 6002 | 5 | -1.00000001 | 6003 | 2-0.95105 | | EM16091 |
| 1711- | 1 | 64 | 6002 | 6 | -1.00000001 | 6003 | 3 0.30901 | | EM16092 |
| 1712- | 1 | 64 | 6002 | 1 | -1.00000001 | 6003 | .00000 | | EM16093 |
| 1713- | 1 | 64 | 6002 | 2 | -1.00000001 | 6003 | 4-0.95105 | | EM16094 |
| 1714- | 1 | 64 | 6002 | 3 | -1.00000001 | 6003 | 5 0.30901 | | EM16095 |
| 1715- | 1 | 64 | 6002 | 4 | -1.00000001 | 6003 | .00000 | | EM16096 |
| 1716- | 1 | 64 | 6002 | 5 | -1.00000001 | 6003 | 6-0.95105 | | EM16097 |
| 1717- | 1 | 64 | 6002 | 6 | -1.00000001 | 6003 | 1 0.30901 | | EM16098 |
| 1718- | 1 | 64 | 6002 | 1 | -1.00000001 | 6003 | .00000 | | EM16099 |
| 1719- | 1 | 64 | 6002 | 2 | -1.00000001 | 6003 | 2-0.95105 | | EM16100 |
| 1720- | 1 | 64 | 6002 | 3 | -1.00000001 | 6003 | 3 0.30901 | | EM16101 |
| 1721- | 1 | 64 | 6002 | 4 | -1.00000001 | 6003 | .00000 | | EM16102 |
| 1722- | 1 | 64 | 6002 | 5 | -1.00000001 | 6003 | 4-0.95105 | | EM16103 |
| 1723- | 1 | 64 | 6002 | 6 | -1.00000001 | 6003 | 5 0.30901 | | EM16104 |
| 1724- | 1 | 64 | 6002 | 1 | -1.00000001 | 6003 | .00000 | | EM16105 |
| 1725- | 1 | 64 | 6002 | 2 | -1.00000001 | 6003 | 6-0.95105 | | EM16106 |
| 1726- | 1 | 64 | 6002 | 3 | -1.00000001 | 6003 | 1 0.30901 | | EM16107 |
| 1727- | 1 | 64 | 6002 | 4 | -1.00000001 | 6003 | .00000 | | EM16108 |
| 1728- | 1 | 64 | 6002 | 5 | -1.00000001 | 6003 | 2-0.95105 | | EM16109 |
| 1729- | 1 | 64 | 6002 | 6 | -1.00000001 | 6003 | 3 0.30901 | | EM16110 |
| 1730- | 1 | 64 | 6002 | 1 | -1.00000001 | 6003 | .00000 | | EM16111 |
| 1731- | 1 | 64 | 6002 | 2 | -1.00000001 | 6003 | 4-0.95105 | | EM16112 |
| 1732- | 1 | 64 | 6002 | 3 | -1.00000001 | 6003 | 5 0.30901 | | EM16113 |
| 1733- | 1 | 64 | 6002 | 4 | -1.00000001 | 6003 | .00000 | | EM16114 |
| 1734- | 1 | 64 | 6002 | 5 | -1.00000001 | 6003 | 6-0.95105 | | EM16115 |
| 1735- | 1 | 64 | 6002 | 6 | -1.00000001 | 6003 | 1 0.30901 | | EM16116 |
| 1736- | 1 | 64 | 6002 | 1 | -1.00000001 | 6003 | .00000 | | EM16117 |
| 1737- | 1 | 64 | 6002 | 2 | -1.00000001 | 6003 | 2-0.95105 | | EM16118 |
| 1738- | 1 | 64 | 6002 | 3 | -1.00000001 | 6003 | 3 0.30901 | | EM16119 |
| 1739- | 1 | 64 | 6002 | 4 | -1.00000001 | 6003 | .00000 | | EM16120 |
| 1740- | 1 | 64 | 6002 | 5 | -1.00000001 | 6003 | 4-0.95105 | | EM16121 |
| 1741- | 1 | 64 | 6002 | 6 | -1.00000001 | 6003 | 5 0.30901 | | EM16122 |
| 1742- | 1 | 64 | 6002 | 1 | -1.00000001 | 6003 | .00000 | | EM16123 |
| 1743- | 1 | 64 | 6002 | 2 | -1.00000001 | 6003 | 6-0.95105 | | EM16124 |
| 1744- | 1 | 64 | 6002 | 3 | -1.00000001 | 6003 | 1 0.30901 | | EM16125 |
| 1745- | 1 | 64 | 6002 | 4 | -1.00000001 | 6003 | .00000 | | EM16126 |
| 1746- | 1 | 64 | 6002 | 5 | -1.00000001 | 6003 | 2-0.95105 | | EM16127 |
| 1747- | 1 | 64 | 6002 | 6 | -1.00000001 | 6003 | 3 0.30901 | | EM16128 |
| 1748- | 1 | 64 | 6002 | 1 | -1.00000001 | 6003 | .00000 | | EM16129 |
| 1749- | 1 | 64 | 6002 | 2 | -1.00000001 | 6003 | 4-0.95105 | | EM16130 |
| 1750- | 1 | 64 | 6002 | 3 | -1.00000001 | 6003 | 5 0.30901 | | EM16131 |

Volume II

SORTED BULK DATA ECHC

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---|----|------|---|--------------|------|---|-----------|---|---------|
| 1751- | 1 | 68 | 7002 | 4 | -1.000007001 | 4 | | .00000 | | EM17014 |
| 1752- | 1 | 68 | 7002 | 5 | 4 0.00000 | 7003 | 5 | 4 0.00000 | | EM17015 |
| 1753- | 1 | 68 | 7002 | 6 | -1.000007001 | 7003 | 6 | 5 1.00000 | | EM17016 |
| 1754- | 1 | 68 | 7002 | 6 | -1.000007001 | 7003 | 6 | .00000 | | EM17016 |
| 1755- | 1 | 68 | 7002 | 6 | -1.000007001 | 7003 | 6 | 6 0.00000 | | EM17021 |
| 1756- | 1 | 69 | 7002 | 1 | -1.000007001 | 7003 | 1 | 1.00000 | | EM17022 |
| 1757- | 1 | 69 | 7002 | 2 | -1.000007001 | 7003 | 2 | .00000 | | EM17022 |
| 1758- | 1 | 69 | 7002 | 3 | -1.000007001 | 7003 | 3 | 2 0.58778 | | EM17023 |
| 1759- | 1 | 69 | 7002 | 4 | -1.000007001 | 7003 | 4 | 3 0.80901 | | EM17024 |
| 1760- | 1 | 69 | 7002 | 5 | -1.000007001 | 7003 | 5 | .00000 | | EM17025 |
| 1761- | 1 | 69 | 7002 | 6 | -1.000007001 | 7003 | 6 | 6 0.58778 | | EM17026 |
| 1762- | 1 | 70 | 7002 | 1 | -1.000007001 | 7003 | 1 | 1.00000 | | EM17031 |
| 1763- | 1 | 70 | 7002 | 2 | -1.000007001 | 7003 | 2 | 1 0.30901 | | EM17032 |
| 1764- | 1 | 70 | 7002 | 3 | -1.000007001 | 7003 | 3 | 2 0.95105 | | EM17033 |
| 1765- | 1 | 70 | 7002 | 4 | -1.000007001 | 7003 | 4 | 3 0.30901 | | EM17034 |
| 1766- | 1 | 70 | 7002 | 5 | -1.000007001 | 7003 | 5 | 4 0.55105 | | EM17035 |
| 1767- | 1 | 70 | 7002 | 6 | -1.000007001 | 7003 | 6 | .00000 | | EM17036 |
| 1768- | 1 | 71 | 7002 | 1 | -1.000007001 | 7003 | 1 | 6 0.95105 | | EM17041 |
| 1769- | 1 | 71 | 7002 | 2 | -1.000007001 | 7003 | 2 | 1.00000 | | EM17042 |
| 1770- | 1 | 71 | 7002 | 3 | -1.000007001 | 7003 | 3 | .00000 | | EM17043 |
| 1771- | 1 | 71 | 7002 | 4 | -1.000007001 | 7003 | 4 | 3 0.30901 | | EM17044 |
| 1772- | 1 | 71 | 7002 | 5 | -1.000007001 | 7003 | 5 | 4 0.95105 | | EM17045 |
| 1773- | 1 | 71 | 7002 | 6 | -1.000007001 | 7003 | 6 | 5 0.30901 | | EM17046 |
| 1774- | 1 | 72 | 7002 | 1 | -1.000007001 | 7003 | 1 | 6 0.95105 | | EM17051 |
| 1775- | 1 | 72 | 7002 | 2 | -1.000007001 | 7003 | 2 | 1.00000 | | EM17052 |
| 1776- | 1 | 72 | 7002 | 3 | -1.000007001 | 7003 | 3 | 2 0.58778 | | EM17053 |
| 1777- | 1 | 72 | 7002 | 4 | -1.000007001 | 7003 | 4 | 3 0.80901 | | EM17054 |
| 1778- | 1 | 72 | 7002 | 5 | -1.000007001 | 7003 | 5 | .00000 | | EM17054 |
| 1779- | 1 | 72 | 7002 | 6 | -1.000007001 | 7003 | 6 | 4 0.58778 | | EM17054 |
| 1780- | 1 | 71 | 7002 | 1 | -1.000007001 | 7003 | 1 | 6 0.95105 | | EM17041 |
| 1781- | 1 | 71 | 7002 | 2 | -1.000007001 | 7003 | 2 | 1.00000 | | EM17042 |
| 1782- | 1 | 71 | 7002 | 3 | -1.000007001 | 7003 | 3 | .00000 | | EM17043 |
| 1783- | 1 | 71 | 7002 | 4 | -1.000007001 | 7003 | 4 | 3 0.30901 | | EM17044 |
| 1784- | 1 | 71 | 7002 | 5 | -1.000007001 | 7003 | 5 | 4 0.95105 | | EM17045 |
| 1785- | 1 | 71 | 7002 | 6 | -1.000007001 | 7003 | 6 | 5 0.30901 | | EM17046 |
| 1786- | 1 | 72 | 7002 | 1 | -1.000007001 | 7003 | 1 | 6 0.95105 | | EM17051 |
| 1787- | 1 | 72 | 7002 | 2 | -1.000007001 | 7003 | 2 | 1.00000 | | EM17052 |
| 1788- | 1 | 72 | 7002 | 3 | -1.000007001 | 7003 | 3 | 2 0.58778 | | EM17053 |
| 1789- | 1 | 72 | 7002 | 4 | -1.000007001 | 7003 | 4 | 3 0.80901 | | EM17054 |
| 1790- | 1 | 72 | 7002 | 5 | -1.000007001 | 7003 | 5 | .00000 | | EM17054 |
| 1791- | 1 | 72 | 7002 | 6 | -1.000007001 | 7003 | 6 | 4 0.58778 | | EM17054 |
| 1792- | 1 | 72 | 7002 | 1 | -1.000007001 | 7003 | 1 | 6 0.95105 | | EM17054 |
| 1793- | 1 | 72 | 7002 | 2 | -1.000007001 | 7003 | 2 | 1.00000 | | EM17054 |
| 1794- | 1 | 72 | 7002 | 3 | -1.000007001 | 7003 | 3 | 2 0.58778 | | EM17054 |
| 1795- | 1 | 72 | 7002 | 4 | -1.000007001 | 7003 | 4 | 3 0.80901 | | EM17054 |
| 1796- | 1 | 72 | 7002 | 5 | -1.000007001 | 7003 | 5 | .00000 | | EM17054 |
| 1797- | 1 | 72 | 7002 | 6 | -1.000007001 | 7003 | 6 | 4 0.58778 | | EM17054 |
| 1798- | 1 | 72 | 7002 | 1 | -1.000007001 | 7003 | 1 | 6 0.95105 | | EM17054 |
| 1799- | 1 | 72 | 7002 | 2 | -1.000007001 | 7003 | 2 | 1.00000 | | EM17054 |
| 1800- | 1 | 72 | 7002 | 3 | -1.000007001 | 7003 | 3 | 2 0.58778 | | EM17054 |

AXISYMMETRIC CIRC. CYL. WITH FLUID

HARMONIC REDUCTION

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S O R T E D B U L K D A T A E C H O

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---|----|------|---|--------------|------|---|-----------|---|---------|
| COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 1801- | 1 | 72 | 7002 | 5 | -1.000007001 | 5 | | 1.00000 | | EM17055 |
| 1802- | 1 | 72 | 7002 | 5 | 0.000007001 | 6 | | 5-0.80901 | | EM17056 |
| 1803- | 1 | 72 | 7002 | 6 | -1.000007001 | 6 | | .00000 | | EM17056 |
| 1804- | 1 | 73 | 7002 | 1 | 6 0.95105 | 7003 | | 6 0.58778 | | EM17061 |
| 1805- | 1 | 73 | 7002 | 1 | -1.000007001 | 1 | | 1.00000 | | EM17061 |
| 1806- | 1 | 73 | 7002 | 2 | 1 0.00000 | 7003 | | 1-1.00000 | | EM17062 |
| 1807- | 1 | 73 | 7002 | 2 | -1.000007001 | 2 | | .00000 | | EM17062 |
| 1808- | 1 | 73 | 7002 | 3 | 2 1.00000 | 7003 | | 2 0.00000 | | EM17063 |
| 1809- | 1 | 73 | 7002 | 3 | -1.000007001 | 3 | | 1.00000 | | EM17063 |
| 1810- | 1 | 73 | 7002 | 3 | 3 0.00000 | 7003 | | 3-1.00000 | | EM17064 |
| 1811- | 1 | 73 | 7002 | 4 | -1.000007001 | 4 | | .00000 | | EM17064 |
| 1812- | 1 | 73 | 7002 | 4 | 4 1.00000 | 7003 | | 4 0.00000 | | EM17065 |
| 1813- | 1 | 73 | 7002 | 5 | -1.000007001 | 5 | | 1.00000 | | EM17065 |
| 1814- | 1 | 73 | 7002 | 5 | 5 0.00000 | 7003 | | 5-1.00000 | | EM17066 |
| 1815- | 1 | 73 | 7002 | 6 | -1.000007001 | 6 | | .00000 | | EM17066 |
| 1816- | 1 | 74 | 7002 | 1 | 6 1.00000 | 7003 | | 6 0.00000 | | EM17071 |
| 1817- | 1 | 74 | 7002 | 1 | -1.000007001 | 1 | | 1.00000 | | EM17071 |
| 1818- | 1 | 74 | 7002 | 2 | 1-0.00000 | 7003 | | 1-0.80901 | | EM17072 |
| 1819- | 1 | 74 | 7002 | 2 | -1.000007001 | 2 | | .00000 | | EM17072 |
| 1820- | 1 | 74 | 7002 | 3 | 2 0.55105 | 7003 | | 2-0.58778 | | EM17073 |
| 1821- | 1 | 74 | 7002 | 3 | -1.000007001 | 3 | | 1.00000 | | EM17073 |
| 1822- | 1 | 74 | 7002 | 4 | 3-0.00000 | 7003 | | 3-0.80901 | | EM17074 |
| 1823- | 1 | 74 | 7002 | 4 | -1.000007001 | 4 | | .00000 | | EM17074 |
| 1824- | 1 | 74 | 7002 | 5 | 4 0.95105 | 7003 | | 4-0.58778 | | EM17075 |
| 1825- | 1 | 74 | 7002 | 5 | -1.000007001 | 5 | | 1.00000 | | EM17075 |
| 1826- | 1 | 74 | 7002 | 6 | 5-0.00000 | 7003 | | 5-0.80901 | | EM17076 |
| 1827- | 1 | 74 | 7002 | 6 | -1.000007001 | 6 | | .00000 | | EM17076 |
| 1828- | 1 | 75 | 7002 | 1 | 6 0.95105 | 7003 | | 6-0.58778 | | EM17081 |
| 1829- | 1 | 75 | 7002 | 1 | -1.000007001 | 1 | | 1.00000 | | EM17081 |
| 1830- | 1 | 75 | 7002 | 2 | 1-0.58778 | 7003 | | 1-0.30901 | | EM17082 |
| 1831- | 1 | 75 | 7002 | 2 | -1.000007001 | 2 | | .00000 | | EM17082 |
| 1832- | 1 | 75 | 7002 | 3 | 2 0.80901 | 7003 | | 2-0.95105 | | EM17083 |
| 1833- | 1 | 75 | 7002 | 3 | -1.000007001 | 3 | | 1.00000 | | EM17083 |
| 1834- | 1 | 75 | 7002 | 4 | 3-0.58778 | 7003 | | 3-0.30901 | | EM17084 |
| 1835- | 1 | 75 | 7002 | 4 | -1.000007001 | 4 | | .00000 | | EM17084 |
| 1836- | 1 | 75 | 7002 | 5 | 4 0.80901 | 7003 | | 4-0.95105 | | EM17085 |
| 1837- | 1 | 75 | 7002 | 5 | -1.000007001 | 5 | | 1.00000 | | EM17085 |
| 1838- | 1 | 75 | 7002 | 6 | 5-0.58778 | 7003 | | 5-0.30901 | | EM17086 |
| 1839- | 1 | 75 | 7002 | 6 | -1.000007001 | 6 | | .00000 | | EM17086 |
| 1840- | 1 | 76 | 7002 | 1 | 6 0.80901 | 7003 | | 6-0.95105 | | EM17091 |
| 1841- | 1 | 76 | 7002 | 1 | -1.000007001 | 1 | | 1.00000 | | EM17091 |
| 1842- | 1 | 76 | 7002 | 2 | 1-0.80901 | 7003 | | 1 0.30901 | | EM17092 |
| 1843- | 1 | 76 | 7002 | 2 | -1.000007001 | 2 | | .00000 | | EM17092 |
| 1844- | 1 | 76 | 7002 | 3 | 2 0.58778 | 7003 | | 2-0.95105 | | EM17093 |
| 1845- | 1 | 76 | 7002 | 3 | -1.000007001 | 3 | | 1.00000 | | EM17093 |
| 1846- | 1 | 76 | 7002 | 4 | 3-0.80901 | 7003 | | 3 0.30901 | | EM17094 |
| 1847- | 1 | 76 | 7002 | 4 | -1.000007001 | 4 | | .00000 | | EM17094 |
| 1848- | 1 | 76 | 7002 | 5 | 4 0.58778 | 7003 | | 4-0.95105 | | EM17095 |
| 1849- | 1 | 76 | 7002 | 5 | -1.000007001 | 5 | | 1.00000 | | EM17095 |
| 1850- | 1 | 76 | 7002 | 5 | 5-0.80901 | 7003 | | 5 0.30901 | | EM17095 |

Volume II

SORTED BULK DATA ECHO

| CARD
COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------------|---|----|------|---|--------------|------|---|-----------|---|---------|
| 1851- | 1 | 76 | 7002 | 6 | -1.000007001 | 6 | | .00000 | | EM17096 |
| 1852- | 1 | 77 | 7002 | 1 | 6 0.58778 | 7003 | 1 | 6-0.95105 | | EM17101 |
| 1853- | 1 | 77 | 7002 | 2 | -1.000007001 | 7003 | 2 | 1.00000 | | EM17102 |
| 1854- | 1 | 77 | 7002 | 3 | -1.000007001 | 7003 | 3 | 1.00000 | | EM17103 |
| 1855- | 1 | 77 | 7002 | 4 | -1.000007001 | 7003 | 4 | 1.00000 | | EM17104 |
| 1856- | 1 | 77 | 7002 | 5 | -1.000007001 | 7003 | 5 | 1.00000 | | EM17105 |
| 1857- | 1 | 77 | 7002 | 6 | -1.000007001 | 7003 | 6 | 1.00000 | | EM17106 |
| 1858- | 1 | 78 | 7002 | 1 | -1.000007001 | 7003 | 1 | 1.00000 | | EM17111 |
| 1859- | 1 | 78 | 7002 | 2 | -1.000007001 | 7003 | 2 | 1.00000 | | EM17112 |
| 1860- | 1 | 78 | 7002 | 3 | -1.000007001 | 7003 | 3 | 1.00000 | | EM17113 |
| 1861- | 1 | 78 | 7002 | 4 | -1.000007001 | 7003 | 4 | 1.00000 | | EM17114 |
| 1862- | 1 | 78 | 7002 | 5 | -1.000007001 | 7003 | 5 | 1.00000 | | EM17115 |
| 1863- | 1 | 78 | 7002 | 6 | -1.000007001 | 7003 | 6 | 1.00000 | | EM17116 |
| 1864- | 1 | 79 | 8002 | 1 | -1.000008001 | 8003 | 1 | 1.00000 | | EM18011 |
| 1865- | 1 | 79 | 8002 | 2 | -1.000008001 | 8003 | 2 | 1.00000 | | EM18012 |
| 1866- | 1 | 79 | 8002 | 3 | -1.000008001 | 8003 | 3 | 1.00000 | | EM18013 |
| 1867- | 1 | 79 | 8002 | 4 | -1.000008001 | 8003 | 4 | 1.00000 | | EM18014 |
| 1868- | 1 | 79 | 8002 | 5 | -1.000008001 | 8003 | 5 | 1.00000 | | EM18015 |
| 1869- | 1 | 79 | 8002 | 6 | -1.000008001 | 8003 | 6 | 1.00000 | | EM18016 |
| 1870- | 1 | 80 | 8002 | 1 | -1.000009001 | 8003 | 1 | 1.00000 | | EM18021 |
| 1871- | 1 | 80 | 8002 | 2 | -1.000009001 | 8003 | 2 | 1.00000 | | EM18022 |
| 1872- | 1 | 80 | 8002 | 3 | -1.000009001 | 8003 | 3 | 1.00000 | | EM18023 |
| 1873- | 1 | 80 | 8002 | 4 | -1.000009001 | 8003 | 4 | 1.00000 | | EM18024 |
| 1874- | 1 | 80 | 8002 | 5 | -1.000009001 | 8003 | 5 | 1.00000 | | EM18025 |
| 1875- | 1 | 80 | 8002 | 6 | -1.000009001 | 8003 | 6 | 1.00000 | | EM18026 |

AXISYMMETRIC CIRC. CYL. WITH FLUID
HARMONIC REDUCTION

MAY 4, 1974 NASTRAN 5/13/72

SORTED BULK DATA ECHO

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---|----|------|---|---------------|---|---------|---|---------|---------|
| COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 1901- | 1 | 81 | 8002 | 1 | -1.0000000001 | 1 | 1.00000 | 1 | 0.30901 | EM18031 |
| 1902- | 1 | 81 | 8002 | 2 | -1.0000000001 | 2 | 0.00000 | 1 | 0.30901 | EM18032 |
| 1903- | 1 | 81 | 8002 | 3 | -1.0000000001 | 3 | 0.00000 | 2 | 0.95105 | EM18033 |
| 1904- | 1 | 81 | 8002 | 4 | -1.0000000001 | 4 | 0.00000 | 3 | 0.30901 | EM18034 |
| 1905- | 1 | 81 | 8002 | 5 | -1.0000000001 | 5 | 0.00000 | 4 | 0.95105 | EM18035 |
| 1906- | 1 | 81 | 8002 | 6 | -1.0000000001 | 6 | 0.00000 | 5 | 0.30901 | EM18036 |
| 1907- | 1 | 81 | 8002 | 1 | -1.0000000001 | 1 | 1.00000 | 6 | 0.95105 | EM18041 |
| 1908- | 1 | 81 | 8002 | 2 | -1.0000000001 | 2 | 0.00000 | 1 | 0.30901 | EM18042 |
| 1909- | 1 | 81 | 8002 | 3 | -1.0000000001 | 3 | 0.00000 | 2 | 0.95105 | EM18043 |
| 1910- | 1 | 81 | 8002 | 4 | -1.0000000001 | 4 | 0.00000 | 3 | 0.30901 | EM18044 |
| 1911- | 1 | 81 | 8002 | 5 | -1.0000000001 | 5 | 0.00000 | 4 | 0.95105 | EM18045 |
| 1912- | 1 | 81 | 8002 | 6 | -1.0000000001 | 6 | 0.00000 | 5 | 0.30901 | EM18046 |
| 1913- | 1 | 81 | 8002 | 1 | -1.0000000001 | 1 | 1.00000 | 6 | 0.95105 | EM18051 |
| 1914- | 1 | 81 | 8002 | 2 | -1.0000000001 | 2 | 0.00000 | 1 | 0.30901 | EM18052 |
| 1915- | 1 | 81 | 8002 | 3 | -1.0000000001 | 3 | 0.00000 | 2 | 0.95105 | EM18053 |
| 1916- | 1 | 81 | 8002 | 4 | -1.0000000001 | 4 | 0.00000 | 3 | 0.30901 | EM18054 |
| 1917- | 1 | 81 | 8002 | 5 | -1.0000000001 | 5 | 0.00000 | 4 | 0.95105 | EM18055 |
| 1918- | 1 | 81 | 8002 | 6 | -1.0000000001 | 6 | 0.00000 | 5 | 0.30901 | EM18056 |
| 1919- | 1 | 81 | 8002 | 1 | -1.0000000001 | 1 | 1.00000 | 6 | 0.95105 | EM18061 |
| 1920- | 1 | 81 | 8002 | 2 | -1.0000000001 | 2 | 0.00000 | 1 | 0.30901 | EM18062 |
| 1921- | 1 | 81 | 8002 | 3 | -1.0000000001 | 3 | 0.00000 | 2 | 0.95105 | EM18063 |
| 1922- | 1 | 81 | 8002 | 4 | -1.0000000001 | 4 | 0.00000 | 3 | 0.30901 | EM18064 |
| 1923- | 1 | 81 | 8002 | 5 | -1.0000000001 | 5 | 0.00000 | 4 | 0.95105 | EM18065 |
| 1924- | 1 | 81 | 8002 | 6 | -1.0000000001 | 6 | 0.00000 | 5 | 0.30901 | EM18066 |
| 1925- | 1 | 81 | 8002 | 1 | -1.0000000001 | 1 | 1.00000 | 6 | 0.95105 | EM18071 |
| 1926- | 1 | 81 | 8002 | 2 | -1.0000000001 | 2 | 0.00000 | 1 | 0.30901 | EM18071 |
| 1927- | 1 | 81 | 8002 | 3 | -1.0000000001 | 3 | 0.00000 | 2 | 0.95105 | EM18071 |
| 1928- | 1 | 81 | 8002 | 4 | -1.0000000001 | 4 | 0.00000 | 3 | 0.30901 | EM18071 |
| 1929- | 1 | 81 | 8002 | 5 | -1.0000000001 | 5 | 0.00000 | 4 | 0.95105 | EM18071 |
| 1930- | 1 | 81 | 8002 | 6 | -1.0000000001 | 6 | 0.00000 | 5 | 0.30901 | EM18071 |
| 1931- | 1 | 81 | 8002 | 1 | -1.0000000001 | 1 | 1.00000 | 6 | 0.95105 | EM18071 |
| 1932- | 1 | 81 | 8002 | 2 | -1.0000000001 | 2 | 0.00000 | 1 | 0.30901 | EM18071 |
| 1933- | 1 | 81 | 8002 | 3 | -1.0000000001 | 3 | 0.00000 | 2 | 0.95105 | EM18071 |
| 1934- | 1 | 81 | 8002 | 4 | -1.0000000001 | 4 | 0.00000 | 3 | 0.30901 | EM18071 |
| 1935- | 1 | 81 | 8002 | 5 | -1.0000000001 | 5 | 0.00000 | 4 | 0.95105 | EM18071 |
| 1936- | 1 | 81 | 8002 | 6 | -1.0000000001 | 6 | 0.00000 | 5 | 0.30901 | EM18071 |
| 1937- | 1 | 81 | 8002 | 1 | -1.0000000001 | 1 | 1.00000 | 6 | 0.95105 | EM18071 |
| 1938- | 1 | 81 | 8002 | 2 | -1.0000000001 | 2 | 0.00000 | 1 | 0.30901 | EM18071 |
| 1939- | 1 | 81 | 8002 | 3 | -1.0000000001 | 3 | 0.00000 | 2 | 0.95105 | EM18071 |
| 1940- | 1 | 81 | 8002 | 4 | -1.0000000001 | 4 | 0.00000 | 3 | 0.30901 | EM18071 |
| 1941- | 1 | 81 | 8002 | 5 | -1.0000000001 | 5 | 0.00000 | 4 | 0.95105 | EM18071 |
| 1942- | 1 | 81 | 8002 | 6 | -1.0000000001 | 6 | 0.00000 | 5 | 0.30901 | EM18071 |
| 1943- | 1 | 81 | 8002 | 1 | -1.0000000001 | 1 | 1.00000 | 6 | 0.95105 | EM18071 |
| 1944- | 1 | 81 | 8002 | 2 | -1.0000000001 | 2 | 0.00000 | 1 | 0.30901 | EM18071 |
| 1945- | 1 | 81 | 8002 | 3 | -1.0000000001 | 3 | 0.00000 | 2 | 0.95105 | EM18071 |
| 1946- | 1 | 81 | 8002 | 4 | -1.0000000001 | 4 | 0.00000 | 3 | 0.30901 | EM18071 |
| 1947- | 1 | 81 | 8002 | 5 | -1.0000000001 | 5 | 0.00000 | 4 | 0.95105 | EM18071 |
| 1948- | 1 | 81 | 8002 | 6 | -1.0000000001 | 6 | 0.00000 | 5 | 0.30901 | EM18071 |
| 1949- | 1 | 81 | 8002 | 1 | -1.0000000001 | 1 | 1.00000 | 6 | 0.95105 | EM18071 |
| 1950- | 1 | 81 | 8002 | 2 | -1.0000000001 | 2 | 0.00000 | 1 | 0.30901 | EM18071 |

ORIGINAL PAGE IS
OF POOR QUALITY

SORTED BULK DATA ECHO

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---|----|------|---|--------------|------|---|-----------|---|---------|
| COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 1951- | 1 | 85 | 8002 | 2 | -1.000000001 | 8003 | 2 | .00000 | | EM18072 |
| 1952- | 1 | 85 | 8002 | 3 | 2 0.05105 | 8003 | | 2-0.58778 | | EM18073 |
| 1953- | 1 | 85 | 8002 | 3 | -1.000000001 | 8003 | | 1.00000 | | EM18074 |
| 1954- | 1 | 85 | 8002 | 4 | 3-0.10901 | 8003 | | 3-0.80901 | | EM18075 |
| 1955- | 1 | 85 | 8002 | 4 | -1.000000001 | 8003 | | .00000 | | EM18076 |
| 1956- | 1 | 85 | 8002 | 5 | 4 0.05105 | 8003 | | 4-0.58778 | | EM18081 |
| 1957- | 1 | 85 | 8002 | 5 | -1.000000001 | 8003 | | 1.00000 | | EM18082 |
| 1958- | 1 | 85 | 8002 | 6 | 5-0.30901 | 8003 | | 5-0.80901 | | EM18083 |
| 1959- | 1 | 85 | 8002 | 6 | -1.000000001 | 8003 | | .00000 | | EM18084 |
| 1960- | 1 | 86 | 8002 | 1 | 6 0.05105 | 8003 | | 6-0.58778 | | EM18085 |
| 1961- | 1 | 86 | 8002 | 1 | -1.000000001 | 8003 | | 1.00000 | | EM18086 |
| 1962- | 1 | 86 | 8002 | 2 | 1-0.58778 | 8003 | | 1-0.30901 | | EM18087 |
| 1963- | 1 | 86 | 8002 | 2 | -1.000000001 | 8003 | | .00000 | | EM18088 |
| 1964- | 1 | 86 | 8002 | 3 | 2 0.05105 | 8003 | | 2-0.95105 | | EM18089 |
| 1965- | 1 | 86 | 8002 | 3 | -1.000000001 | 8003 | | 1.00000 | | EM18090 |
| 1966- | 1 | 86 | 8002 | 4 | 3-0.10901 | 8003 | | 3-0.30901 | | EM18091 |
| 1967- | 1 | 86 | 8002 | 4 | -1.000000001 | 8003 | | .00000 | | EM18092 |
| 1968- | 1 | 86 | 8002 | 5 | 4 0.05105 | 8003 | | 4-0.95105 | | EM18093 |
| 1969- | 1 | 86 | 8002 | 5 | -1.000000001 | 8003 | | 5-0.30901 | | EM18094 |
| 1970- | 1 | 86 | 8002 | 6 | 5-0.58778 | 8003 | | 1.00000 | | EM18095 |
| 1971- | 1 | 87 | 8002 | 1 | -1.000000001 | 8003 | | .00000 | | EM18096 |
| 1972- | 1 | 87 | 8002 | 1 | 6 0.05105 | 8003 | | 6-0.95105 | | EM18097 |
| 1973- | 1 | 87 | 8002 | 1 | -1.000000001 | 8003 | | 1.00000 | | EM18098 |
| 1974- | 1 | 87 | 8002 | 2 | 1-0.10901 | 8003 | | 1 0.30901 | | EM18099 |
| 1975- | 1 | 87 | 8002 | 2 | -1.000000001 | 8003 | | .00000 | | EM18100 |
| 1976- | 1 | 87 | 8002 | 3 | 2 0.05105 | 8003 | | 2-0.95105 | | EM18101 |
| 1977- | 1 | 87 | 8002 | 3 | -1.000000001 | 8003 | | 1.00000 | | EM18102 |
| 1978- | 1 | 87 | 8002 | 4 | 3-0.10901 | 8003 | | 3 0.30901 | | EM18103 |
| 1979- | 1 | 87 | 8002 | 4 | -1.000000001 | 8003 | | .00000 | | EM18104 |
| 1980- | 1 | 87 | 8002 | 5 | 4 0.05105 | 8003 | | 4-0.95105 | | EM18105 |
| 1981- | 1 | 87 | 8002 | 5 | -1.000000001 | 8003 | | 5 0.30901 | | EM18106 |
| 1982- | 1 | 87 | 8002 | 6 | 5-0.80901 | 8003 | | 1.00000 | | EM18107 |
| 1983- | 1 | 87 | 8002 | 6 | -1.000000001 | 8003 | | .00000 | | EM18108 |
| 1984- | 1 | 88 | 8002 | 1 | 6 0.05105 | 8003 | | 6-0.95105 | | EM18109 |
| 1985- | 1 | 88 | 8002 | 1 | -1.000000001 | 8003 | | 1.00000 | | EM18110 |
| 1986- | 1 | 88 | 8002 | 2 | 1-0.58778 | 8003 | | 1 0.80901 | | EM18111 |
| 1987- | 1 | 88 | 8002 | 2 | -1.000000001 | 8003 | | .00000 | | EM18112 |
| 1988- | 1 | 88 | 8002 | 3 | 2 0.05105 | 8003 | | 2-0.58778 | | EM18113 |
| 1989- | 1 | 88 | 8002 | 3 | -1.000000001 | 8003 | | 1.00000 | | EM18114 |
| 1990- | 1 | 88 | 8002 | 4 | 3-0.10901 | 8003 | | 3 0.80901 | | EM18115 |
| 1991- | 1 | 88 | 8002 | 4 | -1.000000001 | 8003 | | .00000 | | EM18116 |
| 1992- | 1 | 88 | 8002 | 5 | 4 0.05105 | 8003 | | 4-0.58778 | | EM18117 |
| 1993- | 1 | 88 | 8002 | 5 | -1.000000001 | 8003 | | 1.00000 | | EM18118 |
| 1994- | 1 | 88 | 8002 | 6 | 5-0.30901 | 8003 | | 5 0.80901 | | EM18119 |
| 1995- | 1 | 88 | 8002 | 6 | -1.000000001 | 8003 | | .00000 | | EM18120 |
| 1996- | 1 | 89 | 8002 | 1 | 6 0.05105 | 8003 | | 6-0.58778 | | EM18121 |
| 1997- | 1 | 89 | 8002 | 1 | -1.000000001 | 8003 | | 1.00000 | | EM18122 |
| 1998- | 1 | 89 | 8002 | 2 | 1-1.00000 | 8003 | | 1 1.00000 | | EM18123 |
| 1999- | 1 | 89 | 8002 | 2 | -1.000000001 | 8003 | | .00000 | | EM18124 |
| 2000- | 1 | 89 | 8002 | 2 | 2 0.00000 | 8003 | | 2-0.00000 | | EM18125 |

AXISYMMETRIC CIRC. CYL. WITH FLUID
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SORTED BULK DATA ECHO

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|----|----|------|---|--------------|------|---|---------|---------|---------|
| COUNT | 1 | 89 | 8002 | 3 | 3 | 8003 | 3 | 1.00000 | 9 | EM18113 |
| 2001- | MP | | | | -1.000000001 | | | 3 | | EM18113 |
| 2002- | MP | | | | -1.000000001 | | | 3 | 1.00000 | EM18114 |
| 2003- | MP | | | | -1.000000001 | | | 4 | .00000 | EM18114 |
| 2004- | MP | | | | -1.000000001 | | | 4 | 4.00000 | EM18115 |
| 2005- | MP | | | | -1.000000001 | | | 5 | 1.00000 | EM18115 |
| 2006- | MP | | | | -1.000000001 | | | 5 | 1.00000 | EM18116 |
| 2007- | MP | | | | -1.000000001 | | | 6 | .00000 | EM18116 |
| 2008- | MP | | | | -1.000000001 | | | 6 | 6.00000 | EM19011 |
| 2009- | MP | | | | -1.000000001 | | | 1 | 1.00000 | EM19011 |
| 2010- | MP | | | | -1.000000001 | | | 1 | 1.00000 | EM19012 |
| 2011- | MP | | | | -1.000000001 | | | 2 | .00000 | EM19012 |
| 2012- | MP | | | | -1.000000001 | | | 2 | 2.00000 | EM19013 |
| 2013- | MP | | | | -1.000000001 | | | 3 | 1.00000 | EM19013 |
| 2014- | MP | | | | -1.000000001 | | | 3 | 3.00000 | EM19014 |
| 2015- | MP | | | | -1.000000001 | | | 4 | .00000 | EM19014 |
| 2016- | MP | | | | -1.000000001 | | | 4 | 4.00000 | EM19015 |
| 2017- | MP | | | | -1.000000001 | | | 5 | 1.00000 | EM19015 |
| 2018- | MP | | | | -1.000000001 | | | 5 | 5.00000 | EM19016 |
| 2019- | MP | | | | -1.000000001 | | | 6 | .00000 | EM19016 |
| 2020- | MP | | | | -1.000000001 | | | 6 | 6.00000 | EM19021 |
| 2021- | MP | | | | -1.000000001 | | | 1 | 1.00000 | EM19021 |
| 2022- | MP | | | | -1.000000001 | | | 1 | 1.00000 | EM19022 |
| 2023- | MP | | | | -1.000000001 | | | 2 | .00000 | EM19022 |
| 2024- | MP | | | | -1.000000001 | | | 2 | 2.00000 | EM19023 |
| 2025- | MP | | | | -1.000000001 | | | 3 | 1.00000 | EM19023 |
| 2026- | MP | | | | -1.000000001 | | | 3 | 3.00000 | EM19024 |
| 2027- | MP | | | | -1.000000001 | | | 4 | .00000 | EM19024 |
| 2028- | MP | | | | -1.000000001 | | | 4 | 4.00000 | EM19025 |
| 2029- | MP | | | | -1.000000001 | | | 5 | 1.00000 | EM19025 |
| 2030- | MP | | | | -1.000000001 | | | 5 | 5.00000 | EM19026 |
| 2031- | MP | | | | -1.000000001 | | | 6 | .00000 | EM19026 |
| 2032- | MP | | | | -1.000000001 | | | 6 | 6.00000 | EM19031 |
| 2033- | MP | | | | -1.000000001 | | | 1 | 1.00000 | EM19031 |
| 2034- | MP | | | | -1.000000001 | | | 1 | 1.00000 | EM19032 |
| 2035- | MP | | | | -1.000000001 | | | 2 | .00000 | EM19032 |
| 2036- | MP | | | | -1.000000001 | | | 2 | 2.00000 | EM19033 |
| 2037- | MP | | | | -1.000000001 | | | 3 | 1.00000 | EM19033 |
| 2038- | MP | | | | -1.000000001 | | | 3 | 3.00000 | EM19034 |
| 2039- | MP | | | | -1.000000001 | | | 4 | .00000 | EM19034 |
| 2040- | MP | | | | -1.000000001 | | | 4 | 4.00000 | EM19035 |
| 2041- | MP | | | | -1.000000001 | | | 5 | 1.00000 | EM19035 |
| 2042- | MP | | | | -1.000000001 | | | 5 | 5.00000 | EM19036 |
| 2043- | MP | | | | -1.000000001 | | | 6 | .00000 | EM19036 |
| 2044- | MP | | | | -1.000000001 | | | 6 | 6.00000 | EM19041 |
| 2045- | MP | | | | -1.000000001 | | | 1 | 1.00000 | EM19041 |
| 2046- | MP | | | | -1.000000001 | | | 1 | 1.00000 | EM19042 |
| 2047- | MP | | | | -1.000000001 | | | 2 | .00000 | EM19042 |
| 2048- | MP | | | | -1.000000001 | | | 2 | 2.00000 | EM19043 |
| 2049- | MP | | | | -1.000000001 | | | 3 | 1.00000 | EM19043 |
| 2050- | MP | | | | -1.000000001 | | | 3 | 3.00000 | EM19043 |

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Volume II

SORTED UULK DATA ECHO

| CARD
COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------------|---------|----|---|-------------|------|---------|---------|---|---|---------|
| 2051- | MPC | 93 | 4 | -1.00000001 | 4 | .00000 | | | | EM19044 |
| 2052- | EM19044 | | 4 | 0.80901 | 9003 | 4 | 0.95105 | | | |
| 2053- | MPC | 93 | 5 | -1.00000001 | 5 | 1.00000 | | | | EM19045 |
| 2054- | EM19045 | | 5 | 0.58778 | 9003 | 5 | 0.30901 | | | |
| 2055- | MPC | 93 | 6 | -1.00000001 | 6 | .00000 | | | | EM19046 |
| 2056- | EM19046 | | 6 | 0.80901 | 9003 | 6 | 0.95105 | | | |
| 2057- | MPC | 94 | 1 | -1.00000001 | 1 | 1.00000 | | | | EM19051 |
| 2058- | EM19051 | | 1 | 0.30901 | 9003 | 1 | 0.80901 | | | |
| 2059- | MPC | 94 | 2 | -1.00000001 | 2 | .00000 | | | | EM19052 |
| 2060- | EM19052 | | 2 | 0.95105 | 9003 | 2 | 0.58778 | | | |
| 2061- | MPC | 94 | 3 | -1.00000001 | 3 | 1.00000 | | | | EM19053 |
| 2062- | EM19053 | | 3 | 0.30901 | 9003 | 3 | 0.80901 | | | |
| 2063- | MPC | 94 | 4 | -1.00000001 | 4 | .00000 | | | | EM19054 |
| 2064- | EM19054 | | 4 | 0.95105 | 9003 | 4 | 0.58778 | | | |
| 2065- | MPC | 94 | 5 | -1.00000001 | 5 | 1.00000 | | | | EM19055 |
| 2066- | EM19055 | | 5 | 0.30901 | 9003 | 5 | 0.80901 | | | |
| 2067- | MPC | 94 | 6 | -1.00000001 | 6 | .00000 | | | | EM19056 |
| 2068- | EM19056 | | 6 | 0.95105 | 9003 | 6 | 0.58778 | | | |
| 2069- | MPC | 95 | 1 | -1.00000001 | 1 | 1.00000 | | | | EM19061 |
| 2070- | EM19061 | | 1 | 0.30901 | 9003 | 1 | 1.00000 | | | |
| 2071- | MPC | 95 | 2 | -1.00000001 | 2 | .00000 | | | | EM19062 |
| 2072- | EM19062 | | 2 | 0.95105 | 9003 | 2 | 0.58778 | | | |
| 2073- | MPC | 95 | 3 | -1.00000001 | 3 | 1.00000 | | | | EM19063 |
| 2074- | EM19063 | | 3 | 0.30901 | 9003 | 3 | 1.00000 | | | |
| 2075- | MPC | 95 | 4 | -1.00000001 | 4 | .00000 | | | | EM19064 |
| 2076- | EM19064 | | 4 | 0.95105 | 9003 | 4 | 0.58778 | | | |
| 2077- | MPC | 95 | 5 | -1.00000001 | 5 | 1.00000 | | | | EM19065 |
| 2078- | EM19065 | | 5 | 0.30901 | 9003 | 5 | 1.00000 | | | |
| 2079- | MPC | 55 | 6 | -1.00000001 | 6 | .00000 | | | | EM19066 |
| 2080- | EM19066 | | 6 | 0.95105 | 9003 | 6 | 0.58778 | | | |
| 2081- | MPC | 96 | 1 | -1.00000001 | 1 | 1.00000 | | | | EM19071 |
| 2082- | EM19071 | | 1 | 0.30901 | 9003 | 1 | 1.00000 | | | |
| 2083- | MPC | 96 | 2 | -1.00000001 | 2 | .00000 | | | | EM19072 |
| 2084- | EM19072 | | 2 | 0.95105 | 9003 | 2 | 0.58778 | | | |
| 2085- | MPC | 96 | 3 | -1.00000001 | 3 | 1.00000 | | | | EM19073 |
| 2086- | EM19073 | | 3 | 0.30901 | 9003 | 3 | 1.00000 | | | |
| 2087- | MPC | 96 | 4 | -1.00000001 | 4 | .00000 | | | | EM19074 |
| 2088- | EM19074 | | 4 | 0.95105 | 9003 | 4 | 0.58778 | | | |
| 2089- | MPC | 96 | 5 | -1.00000001 | 5 | 1.00000 | | | | EM19075 |
| 2090- | EM19075 | | 5 | 0.30901 | 9003 | 5 | 1.00000 | | | |
| 2091- | MPC | 96 | 6 | -1.00000001 | 6 | .00000 | | | | EM19076 |
| 2092- | EM19076 | | 6 | 0.95105 | 9003 | 6 | 0.58778 | | | |
| 2093- | MPC | 97 | 1 | -1.00000001 | 1 | 1.00000 | | | | EM19081 |
| 2094- | EM19081 | | 1 | 0.30901 | 9003 | 1 | 1.00000 | | | |
| 2095- | MPC | 97 | 2 | -1.00000001 | 2 | .00000 | | | | EM19082 |
| 2096- | EM19082 | | 2 | 0.95105 | 9003 | 2 | 0.58778 | | | |
| 2097- | MPC | 97 | 3 | -1.00000001 | 3 | 1.00000 | | | | EM19083 |
| 2098- | EM19083 | | 3 | 0.30901 | 9003 | 3 | 1.00000 | | | |
| 2099- | MPC | 97 | 4 | -1.00000001 | 4 | .00000 | | | | EM19084 |
| 2100- | EM19084 | | 4 | 0.95105 | 9003 | 4 | 0.58778 | | | |

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AXISYMMETRIC CIRC. CYL. WITH FLUID

HARMONIC REDUCTION

SORTED BY DATA ECHD

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---------|---|-------|---|---------------|-------|---------|-----------|---------|---------|
| COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 2101- | MPC | 1 | 97 | 5 | -1.000000001 | 5 | 1.00000 | 5 | 1.00000 | EM19085 |
| 2102- | EM19085 | | 9002 | 5 | 5-0.53778 | 9003 | 5 | 5-0.30901 | | EM19086 |
| 2103- | MPC | 1 | 97 | 6 | -1.000000001 | 6 | | .00000 | | EM19086 |
| 2104- | EM19086 | | 9002 | 6 | 6-0.80901 | 9003 | 1 | 6-0.95105 | | EM19091 |
| 2105- | MPC | 1 | 98 | 1 | -1.000000001 | 1 | | 1.00000 | | EM19091 |
| 2106- | EM19091 | | 9002 | 2 | -1.000000001 | 2 | | .00000 | | EM19092 |
| 2107- | MPC | 1 | 98 | 2 | 2-0.58778 | 9003 | 2 | 2-0.95105 | | EM19092 |
| 2108- | EM19092 | | 9002 | 3 | -1.000000001 | 3 | | 1.00000 | | EM19093 |
| 2109- | MPC | 1 | 98 | 3 | 3-0.80901 | 9003 | 3 | 3-0.30901 | | EM19093 |
| 2110- | EM19093 | | 9002 | 4 | -1.000000001 | 4 | | .00000 | | EM19094 |
| 2111- | MPC | 1 | 98 | 4 | 4-0.58778 | 9003 | 4 | 4-0.95105 | | EM19094 |
| 2112- | EM19094 | | 9002 | 5 | -1.000000001 | 5 | | 1.00000 | | EM19095 |
| 2113- | MPC | 1 | 98 | 5 | 5-0.80901 | 9003 | 5 | 5-0.30901 | | EM19095 |
| 2114- | EM19095 | | 9002 | 6 | -1.000000001 | 6 | | .00000 | | EM19096 |
| 2115- | MPC | 1 | 98 | 6 | 6-0.58778 | 9003 | 6 | 6-0.95105 | | EM19096 |
| 2116- | EM19096 | | 9002 | 1 | -1.000000001 | 1 | | 1.00000 | | EM19101 |
| 2117- | MPC | 1 | 99 | 1 | 1-0.58165 | 9003 | 1 | 1-0.80901 | | EM19101 |
| 2118- | EM19101 | | 9002 | 2 | -1.000000001 | 2 | | .00000 | | EM19102 |
| 2119- | MPC | 1 | 99 | 2 | 2-0.30901 | 9003 | 2 | 2-0.58778 | | EM19102 |
| 2120- | EM19102 | | 9002 | 3 | -1.000000001 | 3 | | 1.00000 | | EM19103 |
| 2121- | MPC | 1 | 99 | 3 | 3-0.58165 | 9003 | 3 | 3-0.90901 | | EM19103 |
| 2122- | EM19103 | | 9002 | 4 | -1.000000001 | 4 | | .00000 | | EM19104 |
| 2123- | MPC | 1 | 99 | 4 | 4-0.30901 | 9003 | 4 | 4-0.58778 | | EM19104 |
| 2124- | EM19104 | | 9002 | 5 | -1.000000001 | 5 | | 1.00000 | | EM19105 |
| 2125- | MPC | 1 | 99 | 5 | 5-0.95105 | 9003 | 5 | 5-0.80901 | | EM19105 |
| 2126- | EM19105 | | 9002 | 6 | -1.000000001 | 6 | | .00000 | | EM19106 |
| 2127- | MPC | 1 | 99 | 6 | 6-0.30901 | 9003 | 6 | 6-0.58778 | | EM19106 |
| 2128- | EM19106 | | 9002 | 1 | -1.000000001 | 1 | | 1.00000 | | EM19111 |
| 2129- | MPC | 1 | 100 | 1 | 1-0.600000001 | 9003 | 1 | 1-0.00000 | | EM19111 |
| 2130- | EM19111 | | 9002 | 2 | -1.000000001 | 2 | | .00000 | | EM19112 |
| 2131- | MPC | 1 | 100 | 2 | 2-0.000000001 | 9003 | 2 | 2-0.00000 | | EM19112 |
| 2132- | EM19112 | | 9002 | 3 | -1.000000001 | 3 | | 1.00000 | | EM19113 |
| 2133- | MPC | 1 | 100 | 3 | 3-1.000000001 | 9003 | 3 | 3-1.00000 | | EM19113 |
| 2134- | EM19113 | | 9002 | 4 | -1.000000001 | 4 | | .00000 | | EM19114 |
| 2135- | MPC | 1 | 100 | 4 | 4-0.000000001 | 9003 | 4 | 4-0.00000 | | EM19114 |
| 2136- | EM19114 | | 9002 | 5 | -1.000000001 | 5 | | 1.00000 | | EM19115 |
| 2137- | MPC | 1 | 100 | 5 | 5-1.000000001 | 9003 | 5 | 5-1.00000 | | EM19115 |
| 2138- | EM19115 | | 9002 | 6 | -1.000000001 | 6 | | .00000 | | EM19116 |
| 2139- | MPC | 1 | 100 | 6 | 6-0.000000001 | 9003 | 6 | 6-0.00000 | | EM19116 |
| 2140- | EM19116 | | 9002 | 1 | -1.000000001 | 1 | | 1.00000 | | EM20011 |
| 2141- | MPC | 1 | 101 | 1 | 1-0.000000001 | 10003 | 1 | 1-0.00000 | | EM20011 |
| 2142- | EM20011 | | 10002 | 2 | -1.000000001 | 2 | | .00000 | | EM20012 |
| 2143- | MPC | 1 | 101 | 2 | 2-0.000000001 | 10003 | 2 | 2-0.00000 | | EM20012 |
| 2144- | EM20012 | | 10002 | 3 | -1.000000001 | 3 | | 1.00000 | | EM20013 |
| 2145- | MPC | 1 | 101 | 3 | 3-1.000000001 | 10003 | 3 | 3-1.00000 | | EM20013 |
| 2146- | EM20013 | | 10002 | 4 | -1.000000001 | 4 | | .00000 | | EM20014 |
| 2147- | MPC | 1 | 101 | 4 | 4-0.000000001 | 10003 | 4 | 4-0.00000 | | EM20014 |
| 2148- | EM20014 | | 10002 | 5 | -1.000000001 | 5 | | 1.00000 | | EM20015 |
| 2149- | MPC | 1 | 101 | 5 | 5-1.000000001 | 10003 | 5 | 5-1.00000 | | EM20015 |
| 2150- | EM20015 | | 10002 | | | | | | | |

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Volume II

SORTED BULK DATA ECHO

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---|-----|-------|---|---------------|-------|---------|-----------|-----------|---------|
| COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 2151- | 1 | 101 | 10002 | 6 | -1.0000010001 | 6 | .00000 | 6 0.00000 | .00000 | EM20016 |
| 2152- | 1 | 102 | 10002 | 1 | 0.00000 | 10003 | 1 | 1.00000 | 1.00000 | EM20021 |
| 2153- | 1 | 102 | 10002 | 1 | 0.95105 | 10003 | 1 | 0.00000 | 0.00000 | EM20022 |
| 2154- | 1 | 102 | 10002 | 2 | -1.0000010001 | 2 | .00000 | 2 0.57778 | 2 0.57778 | EM20023 |
| 2155- | 1 | 102 | 10002 | 3 | -1.0000010001 | 3 | 1.00000 | 3 0.00000 | 3 0.00000 | EM20024 |
| 2156- | 1 | 102 | 10002 | 4 | 0.00000 | 10003 | 4 | 0.58778 | 4 0.58778 | EM20025 |
| 2157- | 1 | 102 | 10002 | 5 | -1.0000010001 | 5 | 1.00000 | 5 0.00000 | 5 0.00000 | EM20026 |
| 2158- | 1 | 102 | 10002 | 6 | -1.0000010001 | 6 | .00000 | 6 0.58778 | 6 0.58778 | EM20031 |
| 2159- | 1 | 103 | 10002 | 1 | 0.00000 | 10003 | 1 | 1.00000 | 1.00000 | EM20032 |
| 2160- | 1 | 103 | 10002 | 2 | -1.0000010001 | 2 | .00000 | 2 0.95105 | 2 0.95105 | EM20033 |
| 2161- | 1 | 103 | 10002 | 3 | -1.0000010001 | 3 | 1.00000 | 3 0.00000 | 3 0.00000 | EM20034 |
| 2162- | 1 | 103 | 10002 | 4 | 0.00000 | 10003 | 4 | 0.58778 | 4 0.58778 | EM20035 |
| 2163- | 1 | 103 | 10002 | 5 | -1.0000010001 | 5 | 1.00000 | 5 0.00000 | 5 0.00000 | EM20036 |
| 2164- | 1 | 103 | 10002 | 6 | -1.0000010001 | 6 | .00000 | 6 0.58778 | 6 0.58778 | EM20041 |
| 2165- | 1 | 104 | 10002 | 1 | 0.00000 | 10003 | 1 | 1.00000 | 1.00000 | EM20042 |
| 2166- | 1 | 104 | 10002 | 2 | -1.0000010001 | 2 | .00000 | 2 0.95105 | 2 0.95105 | EM20043 |
| 2167- | 1 | 104 | 10002 | 3 | -1.0000010001 | 3 | 1.00000 | 3 0.00000 | 3 0.00000 | EM20044 |
| 2168- | 1 | 104 | 10002 | 4 | 0.00000 | 10003 | 4 | 0.58778 | 4 0.58778 | EM20045 |
| 2169- | 1 | 104 | 10002 | 5 | -1.0000010001 | 5 | 1.00000 | 5 0.00000 | 5 0.00000 | EM20046 |
| 2170- | 1 | 104 | 10002 | 6 | -1.0000010001 | 6 | .00000 | 6 0.58778 | 6 0.58778 | EM20051 |
| 2171- | 1 | 105 | 10002 | 1 | 0.00000 | 10003 | 1 | 1.00000 | 1.00000 | EM20052 |
| 2172- | 1 | 105 | 10002 | 2 | -1.0000010001 | 2 | .00000 | 2 0.95105 | 2 0.95105 | EM20053 |
| 2173- | 1 | 105 | 10002 | 3 | -1.0000010001 | 3 | 1.00000 | 3 0.00000 | 3 0.00000 | EM20054 |
| 2174- | 1 | 105 | 10002 | 4 | 0.00000 | 10003 | 4 | 0.58778 | 4 0.58778 | EM20055 |
| 2175- | 1 | 105 | 10002 | 5 | -1.0000010001 | 5 | 1.00000 | 5 0.00000 | 5 0.00000 | EM20056 |
| 2176- | 1 | 105 | 10002 | 6 | -1.0000010001 | 6 | .00000 | 6 0.58778 | 6 0.58778 | |
| 2177- | 1 | 104 | 10002 | 1 | 0.00000 | 10003 | 1 | 1.00000 | 1.00000 | |
| 2178- | 1 | 104 | 10002 | 2 | -1.0000010001 | 2 | .00000 | 2 0.95105 | 2 0.95105 | |
| 2179- | 1 | 104 | 10002 | 3 | -1.0000010001 | 3 | 1.00000 | 3 0.00000 | 3 0.00000 | |
| 2180- | 1 | 104 | 10002 | 4 | 0.00000 | 10003 | 4 | 0.58778 | 4 0.58778 | |
| 2181- | 1 | 104 | 10002 | 5 | -1.0000010001 | 5 | 1.00000 | 5 0.00000 | 5 0.00000 | |
| 2182- | 1 | 104 | 10002 | 6 | -1.0000010001 | 6 | .00000 | 6 0.58778 | 6 0.58778 | |
| 2183- | 1 | 104 | 10002 | 1 | 0.00000 | 10003 | 1 | 1.00000 | 1.00000 | |
| 2184- | 1 | 104 | 10002 | 2 | -1.0000010001 | 2 | .00000 | 2 0.95105 | 2 0.95105 | |
| 2185- | 1 | 104 | 10002 | 3 | -1.0000010001 | 3 | 1.00000 | 3 0.00000 | 3 0.00000 | |
| 2186- | 1 | 104 | 10002 | 4 | 0.00000 | 10003 | 4 | 0.58778 | 4 0.58778 | |
| 2187- | 1 | 104 | 10002 | 5 | -1.0000010001 | 5 | 1.00000 | 5 0.00000 | 5 0.00000 | |
| 2188- | 1 | 104 | 10002 | 6 | -1.0000010001 | 6 | .00000 | 6 0.58778 | 6 0.58778 | |
| 2189- | 1 | 105 | 10002 | 1 | 0.00000 | 10003 | 1 | 1.00000 | 1.00000 | |
| 2190- | 1 | 105 | 10002 | 2 | -1.0000010001 | 2 | .00000 | 2 0.95105 | 2 0.95105 | |
| 2191- | 1 | 105 | 10002 | 3 | -1.0000010001 | 3 | 1.00000 | 3 0.00000 | 3 0.00000 | |
| 2192- | 1 | 105 | 10002 | 4 | 0.00000 | 10003 | 4 | 0.58778 | 4 0.58778 | |
| 2193- | 1 | 105 | 10002 | 5 | -1.0000010001 | 5 | 1.00000 | 5 0.00000 | 5 0.00000 | |
| 2194- | 1 | 105 | 10002 | 6 | -1.0000010001 | 6 | .00000 | 6 0.58778 | 6 0.58778 | |
| 2195- | 1 | 105 | 10002 | 1 | 0.00000 | 10003 | 1 | 1.00000 | 1.00000 | |
| 2196- | 1 | 105 | 10002 | 2 | -1.0000010001 | 2 | .00000 | 2 0.95105 | 2 0.95105 | |
| 2197- | 1 | 105 | 10002 | 3 | -1.0000010001 | 3 | 1.00000 | 3 0.00000 | 3 0.00000 | |
| 2198- | 1 | 105 | 10002 | 4 | 0.00000 | 10003 | 4 | 0.58778 | 4 0.58778 | |
| 2199- | 1 | 105 | 10002 | 5 | -1.0000010001 | 5 | 1.00000 | 5 0.00000 | 5 0.00000 | |
| 2200- | 1 | 105 | 10002 | 6 | -1.0000010001 | 6 | .00000 | 6 0.58778 | 6 0.58778 | |

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AXISYMMETRIC CIRC. CYL. WITH FLUID
HARMONIC REDUCTION

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---------|-----|-------|---|---------------|-------|-----------|---|----|----|
| COUNT | 1 | 106 | 10002 | 1 | -1.0000010001 | 1 | 1.00000 | 9 | .. | 10 |
| 2201- | MPC | 1 | 106 | 1 | -1.0000010001 | 1 | 1.00000 | 9 | .. | 10 |
| 2202- | EM20061 | 1 | 10002 | 1 | 1.000000 | 10003 | 1-1.00000 | 9 | .. | 10 |
| 2203- | MPC | 1 | 106 | 2 | -1.0000010001 | 2 | .00000 | 9 | .. | 10 |
| 2204- | EM20062 | 1 | 10002 | 2 | 2.1.00000 | 10003 | 2.0.00000 | 9 | .. | 10 |
| 2205- | MPC | 1 | 106 | 3 | -1.0000010001 | 3 | 1.00000 | 9 | .. | 10 |
| 2206- | EM20063 | 1 | 10002 | 3 | 3.0.00000 | 10003 | 3-1.00000 | 9 | .. | 10 |
| 2207- | MPC | 1 | 106 | 4 | -1.0000010001 | 4 | .00000 | 9 | .. | 10 |
| 2208- | EM20064 | 1 | 10002 | 4 | 4.1.00000 | 10003 | 4.0.00000 | 9 | .. | 10 |
| 2209- | MPC | 1 | 106 | 5 | -1.0000010001 | 5 | 1.00000 | 9 | .. | 10 |
| 2210- | EM20065 | 1 | 10002 | 5 | 5.0.00000 | 10003 | 5-1.00000 | 9 | .. | 10 |
| 2211- | MPC | 1 | 106 | 6 | -1.0000010001 | 6 | .00000 | 9 | .. | 10 |
| 2212- | EM20066 | 1 | 10002 | 6 | 6.1.00000 | 10003 | 6.0.00000 | 9 | .. | 10 |
| 2213- | MPC | 1 | 107 | 1 | -1.0000010001 | 1 | 1.00000 | 9 | .. | 10 |
| 2214- | EM20071 | 1 | 10002 | 1 | 1-0.30901 | 10003 | 1-0.80901 | 9 | .. | 10 |
| 2215- | MPC | 1 | 107 | 2 | -1.0000010001 | 2 | .00000 | 9 | .. | 10 |
| 2216- | EM20072 | 1 | 10002 | 2 | 2.3.5105 | 10003 | 2-0.58778 | 9 | .. | 10 |
| 2217- | MPC | 1 | 107 | 3 | -1.0000010001 | 3 | 1.00000 | 9 | .. | 10 |
| 2218- | EM20073 | 1 | 10002 | 3 | 3-0.30901 | 10003 | 3-0.80901 | 9 | .. | 10 |
| 2219- | MPC | 1 | 107 | 4 | -1.0000010001 | 4 | .00000 | 9 | .. | 10 |
| 2220- | EM20074 | 1 | 10002 | 4 | 4.0.95105 | 10003 | 4-0.58778 | 9 | .. | 10 |
| 2221- | MPC | 1 | 107 | 5 | -1.0000010001 | 5 | 1.00000 | 9 | .. | 10 |
| 2222- | EM20075 | 1 | 10002 | 5 | 5-0.30901 | 10003 | 5-0.80901 | 9 | .. | 10 |
| 2223- | MPC | 1 | 107 | 6 | -1.0000010001 | 6 | .00000 | 9 | .. | 10 |
| 2224- | EM20076 | 1 | 10002 | 6 | 6.0.5105 | 10003 | 6-0.58778 | 9 | .. | 10 |
| 2225- | MPC | 1 | 108 | 1 | -1.0000010001 | 1 | 1.00000 | 9 | .. | 10 |
| 2226- | EM20081 | 1 | 10002 | 1 | 1-0.58778 | 10003 | 1-0.30901 | 9 | .. | 10 |
| 2227- | MPC | 1 | 108 | 2 | -1.0000010001 | 2 | .00000 | 9 | .. | 10 |
| 2228- | EM20082 | 1 | 10002 | 2 | 2.0.95105 | 10003 | 2-0.95105 | 9 | .. | 10 |
| 2229- | MPC | 1 | 108 | 3 | -1.0000010001 | 3 | 1.00000 | 9 | .. | 10 |
| 2230- | EM20083 | 1 | 10002 | 3 | 3-0.58778 | 10003 | 3-0.30901 | 9 | .. | 10 |
| 2231- | MPC | 1 | 108 | 4 | -1.0000010001 | 4 | .00000 | 9 | .. | 10 |
| 2232- | EM20084 | 1 | 10002 | 4 | 4.0.5105 | 10003 | 4-0.95105 | 9 | .. | 10 |
| 2233- | MPC | 1 | 108 | 5 | -1.0000010001 | 5 | 1.00000 | 9 | .. | 10 |
| 2234- | EM20085 | 1 | 10002 | 5 | 5-0.58778 | 10003 | 5-0.30901 | 9 | .. | 10 |
| 2235- | MPC | 1 | 108 | 6 | -1.0000010001 | 6 | .00000 | 9 | .. | 10 |
| 2236- | EM20086 | 1 | 10002 | 6 | 6.0.95105 | 10003 | 6-0.95105 | 9 | .. | 10 |
| 2237- | MPC | 1 | 109 | 1 | -1.0000010001 | 1 | 1.00000 | 9 | .. | 10 |
| 2238- | EM20091 | 1 | 10002 | 1 | 1-0.30901 | 10003 | 1-0.30901 | 9 | .. | 10 |
| 2239- | MPC | 1 | 109 | 2 | -1.0000010001 | 2 | .00000 | 9 | .. | 10 |
| 2240- | EM20092 | 1 | 10002 | 2 | 2.0.58778 | 10003 | 2-0.95105 | 9 | .. | 10 |
| 2241- | MPC | 1 | 109 | 3 | -1.0000010001 | 3 | 1.00000 | 9 | .. | 10 |
| 2242- | EM20093 | 1 | 10002 | 3 | 3-0.30901 | 10003 | 3-0.30901 | 9 | .. | 10 |
| 2243- | MPC | 1 | 109 | 4 | -1.0000010001 | 4 | .00000 | 9 | .. | 10 |
| 2244- | EM20094 | 1 | 10002 | 4 | 4.0.58778 | 10003 | 4-0.95105 | 9 | .. | 10 |
| 2245- | MPC | 1 | 109 | 5 | -1.0000010001 | 5 | 1.00000 | 9 | .. | 10 |
| 2246- | EM20095 | 1 | 10002 | 5 | 5-0.30901 | 10003 | 5-0.30901 | 9 | .. | 10 |
| 2247- | MPC | 1 | 109 | 6 | -1.0000010001 | 6 | .00000 | 9 | .. | 10 |
| 2248- | EM20096 | 1 | 10002 | 6 | 6.0.58778 | 10003 | 6-0.95105 | 9 | .. | 10 |
| 2249- | MPC | 1 | 110 | 1 | -1.0000010001 | 1 | 1.00000 | 9 | .. | 10 |
| 2250- | EM20101 | 1 | 10002 | 1 | 1-0.95105 | 10003 | 1-0.80901 | 9 | .. | 10 |

SORTED BULK DATA ECHO

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---------|-----|-------|---|---------------|-------|---|-----------|---|---------|
| COUNT | 1 | 110 | 10002 | 2 | -1.0000010001 | 2 | | .00000 | | EM20102 |
| 2251- | MPC | | | | 2 0.30901 | 10003 | | 2-0.58778 | | |
| 2252- | EM20102 | | | | | | | 1.00000 | | EM20103 |
| 2253- | MPC | 1 | 110 | 3 | -1.0000010001 | 3 | | 3 0.80901 | | |
| 2254- | EM20103 | | | | 3-0.95105 | 10003 | | .00000 | | EM20104 |
| 2255- | MPC | 1 | 110 | 4 | -1.0000010001 | 4 | | 4-0.58778 | | |
| 2256- | EM20104 | | | | 4 0.30901 | 10003 | | 1.00000 | | EM20105 |
| 2257- | MPC | 1 | 110 | 5 | -1.0000010001 | 5 | | 5 0.80901 | | |
| 2258- | EM20105 | | | | 5-0.95105 | 10003 | | .00000 | | EM20106 |
| 2259- | MPC | 1 | 110 | 6 | -1.0000010001 | 6 | | 6-0.58778 | | |
| 2260- | EM20106 | | | | 6 0.30901 | 10003 | | 1.00000 | | EM20107 |
| 2261- | MPC | 1 | 111 | 1 | -1.0000010001 | 1 | | 1 1.00000 | | |
| 2262- | EM20107 | | | | 1-1.00000 | 10003 | | .00000 | | EM20108 |
| 2263- | MPC | 1 | 111 | 2 | -1.0000010001 | 2 | | 2-0.58778 | | |
| 2264- | EM20108 | | | | 2 0.30901 | 10003 | | 1.00000 | | EM20109 |
| 2265- | MPC | 1 | 111 | 3 | -1.0000010001 | 3 | | 3 1.00000 | | |
| 2266- | EM20109 | | | | 3-1.00000 | 10003 | | .00000 | | EM20110 |
| 2267- | MPC | 1 | 111 | 4 | -1.0000010001 | 4 | | 4-0.58778 | | |
| 2268- | EM20110 | | | | 4 0.30901 | 10003 | | 1.00000 | | EM20111 |
| 2269- | MPC | 1 | 111 | 5 | -1.0000010001 | 5 | | 5 1.00000 | | |
| 2270- | EM20111 | | | | 5-1.00000 | 10003 | | .00000 | | EM20112 |
| 2271- | MPC | 1 | 111 | 6 | -1.0000010001 | 6 | | 6-0.58778 | | |
| 2272- | EM20112 | | | | 6 0.30901 | 10003 | | 1.00000 | | EM20113 |
| 2273- | MPC | 1 | 112 | 1 | -1.0000010001 | 1 | | 1 1.00000 | | |
| 2274- | EM20113 | | | | 1-1.00000 | 10003 | | .00000 | | EM20114 |
| 2275- | MPC | 1 | 112 | 2 | -1.0000010001 | 2 | | 2 1.00000 | | |
| 2276- | EM20114 | | | | 2 0.30901 | 10003 | | 1.00000 | | EM20115 |
| 2277- | MPC | 1 | 112 | 3 | -1.0000010001 | 3 | | 3 1.00000 | | |
| 2278- | EM20115 | | | | 3-1.00000 | 10003 | | .00000 | | EM20116 |
| 2279- | MPC | 1 | 112 | 4 | -1.0000010001 | 4 | | 4-0.58778 | | |
| 2280- | EM20116 | | | | 4 0.30901 | 10003 | | 1.00000 | | EM20117 |
| 2281- | MPC | 1 | 112 | 5 | -1.0000010001 | 5 | | 5 1.00000 | | |
| 2282- | EM20117 | | | | 5-1.00000 | 10003 | | .00000 | | EM20118 |
| 2283- | MPC | 1 | 112 | 6 | -1.0000010001 | 6 | | 6-0.58778 | | |
| 2284- | EM20118 | | | | 6 0.30901 | 10003 | | 1.00000 | | EM20119 |
| 2285- | MPC | 1 | 113 | 1 | -1.0000010001 | 1 | | 1 1.00000 | | |
| 2286- | EM20119 | | | | 1-1.00000 | 10003 | | .00000 | | EM20120 |
| 2287- | MPC | 1 | 113 | 2 | -1.0000010001 | 2 | | 2 1.00000 | | |
| 2288- | EM20120 | | | | 2 0.30901 | 10003 | | 1.00000 | | EM20121 |
| 2289- | MPC | 1 | 113 | 3 | -1.0000010001 | 3 | | 3 1.00000 | | |
| 2290- | EM20121 | | | | 3-1.00000 | 10003 | | .00000 | | EM20122 |
| 2291- | MPC | 1 | 113 | 4 | -1.0000010001 | 4 | | 4-0.58778 | | |
| 2292- | EM20122 | | | | 4 0.30901 | 10003 | | 1.00000 | | EM20123 |
| 2293- | MPC | 1 | 113 | 5 | -1.0000010001 | 5 | | 5 1.00000 | | |
| 2294- | EM20123 | | | | 5-1.00000 | 10003 | | .00000 | | EM20124 |
| 2295- | MPC | 1 | 113 | 6 | -1.0000010001 | 6 | | 6-0.58778 | | |
| 2296- | EM20124 | | | | 6 0.30901 | 10003 | | 1.00000 | | EM20125 |
| 2297- | MPC | 1 | 114 | 1 | -1.0000010001 | 1 | | 1 1.00000 | | |
| 2298- | EM20125 | | | | 1-1.00000 | 10003 | | .00000 | | EM20126 |
| 2299- | MPC | 1 | 114 | 2 | -1.0000010001 | 2 | | 2 1.00000 | | |
| 2300- | EM20126 | | | | 2 0.30901 | 10003 | | 1.00000 | | EM20127 |

MAY 4, 1974 NASTRAN 5/13/72

AXISYMMETRIC CIRC. CYL. WITH FLUID

HARMONIC REDUCTION

S O R T E D B U L K D A T A E C H O

| CARD | COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|-------|-----|----|---------------|----|---------|---|---|---|---|---------|
| 2301- | 1 | 114 | 3 | -1.0000011001 | 3 | 1.00000 | | | | | EM21033 |
| 2302- | 1 | 114 | 4 | -1.0000011001 | 4 | 0.00000 | | | | | EM21034 |
| 2303- | 1 | 114 | 5 | -1.0000011001 | 5 | 0.00000 | | | | | EM21035 |
| 2304- | 1 | 114 | 6 | -1.0000011001 | 6 | 0.00000 | | | | | EM21036 |
| 2305- | 1 | 114 | 7 | -1.0000011001 | 7 | 0.00000 | | | | | EM21037 |
| 2306- | 1 | 114 | 8 | -1.0000011001 | 8 | 0.00000 | | | | | EM21038 |
| 2307- | 1 | 114 | 9 | -1.0000011001 | 9 | 0.00000 | | | | | EM21039 |
| 2308- | 1 | 114 | 10 | -1.0000011001 | 10 | 0.00000 | | | | | EM21040 |
| 2309- | 1 | 114 | 11 | -1.0000011001 | 11 | 0.00000 | | | | | EM21041 |
| 2310- | 1 | 114 | 12 | -1.0000011001 | 12 | 0.00000 | | | | | EM21042 |
| 2311- | 1 | 114 | 13 | -1.0000011001 | 13 | 0.00000 | | | | | EM21043 |
| 2312- | 1 | 114 | 14 | -1.0000011001 | 14 | 0.00000 | | | | | EM21044 |
| 2313- | 1 | 114 | 15 | -1.0000011001 | 15 | 0.00000 | | | | | EM21045 |
| 2314- | 1 | 114 | 16 | -1.0000011001 | 16 | 0.00000 | | | | | EM21046 |
| 2315- | 1 | 114 | 17 | -1.0000011001 | 17 | 0.00000 | | | | | EM21051 |
| 2316- | 1 | 114 | 18 | -1.0000011001 | 18 | 0.00000 | | | | | EM21052 |
| 2317- | 1 | 114 | 19 | -1.0000011001 | 19 | 0.00000 | | | | | EM21053 |
| 2318- | 1 | 114 | 20 | -1.0000011001 | 20 | 0.00000 | | | | | EM21054 |
| 2319- | 1 | 114 | 21 | -1.0000011001 | 21 | 0.00000 | | | | | EM21055 |
| 2320- | 1 | 114 | 22 | -1.0000011001 | 22 | 0.00000 | | | | | EM21056 |
| 2321- | 1 | 114 | 23 | -1.0000011001 | 23 | 0.00000 | | | | | EM21061 |
| 2322- | 1 | 114 | 24 | -1.0000011001 | 24 | 0.00000 | | | | | EM21062 |
| 2323- | 1 | 114 | 25 | -1.0000011001 | 25 | 0.00000 | | | | | EM21063 |
| 2324- | 1 | 114 | 26 | -1.0000011001 | 26 | 0.00000 | | | | | EM21064 |
| 2325- | 1 | 114 | 27 | -1.0000011001 | 27 | 0.00000 | | | | | EM21065 |
| 2326- | 1 | 114 | 28 | -1.0000011001 | 28 | 0.00000 | | | | | EM21066 |
| 2327- | 1 | 114 | 29 | -1.0000011001 | 29 | 0.00000 | | | | | EM21071 |
| 2328- | 1 | 114 | 30 | -1.0000011001 | 30 | 0.00000 | | | | | EM21072 |
| 2329- | 1 | 114 | 31 | -1.0000011001 | 31 | 0.00000 | | | | | EM21073 |
| 2330- | 1 | 114 | 32 | -1.0000011001 | 32 | 0.00000 | | | | | |
| 2331- | 1 | 114 | 33 | -1.0000011001 | 33 | 0.00000 | | | | | |
| 2332- | 1 | 114 | 34 | -1.0000011001 | 34 | 0.00000 | | | | | |
| 2333- | 1 | 114 | 35 | -1.0000011001 | 35 | 0.00000 | | | | | |
| 2334- | 1 | 114 | 36 | -1.0000011001 | 36 | 0.00000 | | | | | |
| 2335- | 1 | 114 | 37 | -1.0000011001 | 37 | 0.00000 | | | | | |
| 2336- | 1 | 114 | 38 | -1.0000011001 | 38 | 0.00000 | | | | | |
| 2337- | 1 | 114 | 39 | -1.0000011001 | 39 | 0.00000 | | | | | |
| 2338- | 1 | 114 | 40 | -1.0000011001 | 40 | 0.00000 | | | | | |
| 2339- | 1 | 114 | 41 | -1.0000011001 | 41 | 0.00000 | | | | | |
| 2340- | 1 | 114 | 42 | -1.0000011001 | 42 | 0.00000 | | | | | |
| 2341- | 1 | 114 | 43 | -1.0000011001 | 43 | 0.00000 | | | | | |
| 2342- | 1 | 114 | 44 | -1.0000011001 | 44 | 0.00000 | | | | | |
| 2343- | 1 | 114 | 45 | -1.0000011001 | 45 | 0.00000 | | | | | |
| 2344- | 1 | 114 | 46 | -1.0000011001 | 46 | 0.00000 | | | | | |
| 2345- | 1 | 114 | 47 | -1.0000011001 | 47 | 0.00000 | | | | | |
| 2346- | 1 | 114 | 48 | -1.0000011001 | 48 | 0.00000 | | | | | |
| 2347- | 1 | 114 | 49 | -1.0000011001 | 49 | 0.00000 | | | | | |
| 2348- | 1 | 114 | 50 | -1.0000011001 | 50 | 0.00000 | | | | | |
| 2349- | 1 | 114 | 51 | -1.0000011001 | 51 | 0.00000 | | | | | |
| 2350- | 1 | 114 | 52 | -1.0000011001 | 52 | 0.00000 | | | | | |

SORTED BULK DATA ECHO

| CAHD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------|---|-------|-------|---------------|---------------|-------|-----------|---------|---|---------|
| CUUNT | 1 | 118 | 11002 | 4 | -1.0000011001 | 4 | | .00000 | | EM21074 |
| 2351- | 1 | 11002 | 4 | 0.95105 | 11003 | 4 | 0.58778 | | | |
| EM21074 | 1 | 118 | 5 | -1.0000011001 | 5 | | 1.00000 | | | EM21075 |
| 2352- | 1 | 11002 | 6 | -1.0000011001 | 6 | | .00000 | | | EM21076 |
| EM21075 | 1 | 118 | 11002 | 6 | 0.95105 | 11003 | 6 | 0.58778 | | |
| 2353- | 1 | 11002 | 1 | -1.0000011001 | 1 | | 1.00000 | | | EM21081 |
| EM21076 | 1 | 119 | 11002 | 2 | -1.0000011001 | 2 | 1.00000 | | | EM21082 |
| 2354- | 1 | 119 | 11002 | 3 | -1.0000011001 | 3 | 2.0.95105 | | | EM21083 |
| EM21081 | 1 | 119 | 11002 | 4 | -1.0000011001 | 4 | .00000 | | | EM21084 |
| 2355- | 1 | 119 | 11002 | 5 | -1.0000011001 | 5 | 4.0.95105 | | | EM21085 |
| EM21082 | 1 | 119 | 11002 | 6 | -1.0000011001 | 6 | 1.00000 | | | EM21086 |
| 2356- | 1 | 120 | 11002 | 1 | -1.0000011001 | 1 | 6.0.95105 | | | EM21091 |
| EM21083 | 1 | 120 | 11002 | 2 | -1.0000011001 | 2 | 1.00000 | | | EM21092 |
| 2357- | 1 | 120 | 11002 | 3 | -1.0000011001 | 3 | 2.0.95105 | | | EM21093 |
| EM21084 | 1 | 120 | 11002 | 4 | -1.0000011001 | 4 | .00000 | | | EM21094 |
| 2358- | 1 | 120 | 11002 | 5 | -1.0000011001 | 5 | 4.0.95105 | | | EM21095 |
| EM21085 | 1 | 120 | 11002 | 6 | -1.0000011001 | 6 | 5.0.30901 | | | EM21096 |
| 2359- | 1 | 121 | 11002 | 1 | -1.0000011001 | 1 | 6.0.95105 | | | EM21101 |
| EM21086 | 1 | 121 | 11002 | 2 | -1.0000011001 | 2 | 1.00000 | | | EM21102 |
| 2360- | 1 | 121 | 11002 | 3 | -1.0000011001 | 3 | 2.0.58778 | | | EM21103 |
| EM21091 | 1 | 121 | 11002 | 4 | -1.0000011001 | 4 | .00000 | | | EM21104 |
| 2361- | 1 | 121 | 11002 | 5 | -1.0000011001 | 5 | 4.0.95105 | | | EM21105 |
| EM21092 | 1 | 121 | 11002 | 6 | -1.0000011001 | 6 | 5.0.30901 | | | EM21106 |
| 2362- | 1 | 121 | 11002 | 1 | -1.0000011001 | 1 | 6.0.95105 | | | EM21111 |
| EM21093 | 1 | 121 | 11002 | 2 | -1.0000011001 | 2 | 1.00000 | | | EM21112 |
| 2363- | 1 | 121 | 11002 | 3 | -1.0000011001 | 3 | 2.0.58778 | | | EM21113 |
| EM21094 | 1 | 121 | 11002 | 4 | -1.0000011001 | 4 | .00000 | | | EM21114 |
| 2364- | 1 | 121 | 11002 | 5 | -1.0000011001 | 5 | 4.0.95105 | | | |
| EM21095 | 1 | 121 | 11002 | 6 | -1.0000011001 | 6 | 5.0.30901 | | | |
| 2365- | 1 | 122 | 11002 | 1 | -1.0000011001 | 1 | 6.0.95105 | | | |
| EM21096 | 1 | 122 | 11002 | 2 | -1.0000011001 | 2 | 1.00000 | | | |
| 2366- | 1 | 122 | 11002 | 3 | -1.0000011001 | 3 | 2.0.58778 | | | |
| EM21097 | 1 | 122 | 11002 | 4 | -1.0000011001 | 4 | .00000 | | | |
| 2367- | 1 | 122 | 11002 | 5 | -1.0000011001 | 5 | 4.0.95105 | | | |
| EM21098 | 1 | 122 | 11002 | 6 | -1.0000011001 | 6 | 5.0.30901 | | | |
| 2368- | 1 | 122 | 11002 | 1 | -1.0000011001 | 1 | 6.0.95105 | | | |
| EM21099 | 1 | 122 | 11002 | 2 | -1.0000011001 | 2 | 1.00000 | | | |
| 2369- | 1 | 122 | 11002 | 3 | -1.0000011001 | 3 | 2.0.58778 | | | |
| EM21100 | 1 | 122 | 11002 | 4 | -1.0000011001 | 4 | .00000 | | | |
| 2370- | 1 | 122 | 11002 | 5 | -1.0000011001 | 5 | 4.0.95105 | | | |
| EM21101 | 1 | 122 | 11002 | 6 | -1.0000011001 | 6 | 5.0.30901 | | | |
| 2371- | 1 | 122 | 11002 | 1 | -1.0000011001 | 1 | 6.0.95105 | | | |
| EM21102 | 1 | 122 | 11002 | 2 | -1.0000011001 | 2 | 1.00000 | | | |
| 2372- | 1 | 122 | 11002 | 3 | -1.0000011001 | 3 | 2.0.58778 | | | |
| EM21103 | 1 | 122 | 11002 | 4 | -1.0000011001 | 4 | .00000 | | | |
| 2373- | 1 | 122 | 11002 | 5 | -1.0000011001 | 5 | 4.0.95105 | | | |
| EM21104 | 1 | 122 | 11002 | 6 | -1.0000011001 | 6 | 5.0.30901 | | | |
| 2374- | 1 | 122 | 11002 | 1 | -1.0000011001 | 1 | 6.0.95105 | | | |
| EM21105 | 1 | 122 | 11002 | 2 | -1.0000011001 | 2 | 1.00000 | | | |
| 2375- | 1 | 122 | 11002 | 3 | -1.0000011001 | 3 | 2.0.58778 | | | |
| EM21106 | 1 | 122 | 11002 | 4 | -1.0000011001 | 4 | .00000 | | | |
| 2376- | 1 | 122 | 11002 | 5 | -1.0000011001 | 5 | 4.0.95105 | | | |
| EM21107 | 1 | 122 | 11002 | 6 | -1.0000011001 | 6 | 5.0.30901 | | | |
| 2377- | 1 | 122 | 11002 | 1 | -1.0000011001 | 1 | 6.0.95105 | | | |
| EM21108 | 1 | 122 | 11002 | 2 | -1.0000011001 | 2 | 1.00000 | | | |
| 2378- | 1 | 122 | 11002 | 3 | -1.0000011001 | 3 | 2.0.58778 | | | |
| EM21109 | 1 | 122 | 11002 | 4 | -1.0000011001 | 4 | .00000 | | | |
| 2379- | 1 | 122 | 11002 | 5 | -1.0000011001 | 5 | 4.0.95105 | | | |
| EM21110 | 1 | 122 | 11002 | 6 | -1.0000011001 | 6 | 5.0.30901 | | | |
| 2380- | 1 | 122 | 11002 | 1 | -1.0000011001 | 1 | 6.0.95105 | | | |
| EM21111 | 1 | 122 | 11002 | 2 | -1.0000011001 | 2 | 1.00000 | | | |
| 2381- | 1 | 122 | 11002 | 3 | -1.0000011001 | 3 | 2.0.58778 | | | |
| EM21112 | 1 | 122 | 11002 | 4 | -1.0000011001 | 4 | .00000 | | | |
| 2382- | 1 | 122 | 11002 | 5 | -1.0000011001 | 5 | 4.0.95105 | | | |
| EM21113 | 1 | 122 | 11002 | 6 | -1.0000011001 | 6 | 5.0.30901 | | | |
| 2383- | 1 | 122 | 11002 | 1 | -1.0000011001 | 1 | 6.0.95105 | | | |
| EM21114 | 1 | 122 | 11002 | 2 | -1.0000011001 | 2 | 1.00000 | | | |
| 2384- | 1 | 122 | 11002 | 3 | -1.0000011001 | 3 | 2.0.58778 | | | |
| EM21115 | 1 | 122 | 11002 | 4 | -1.0000011001 | 4 | .00000 | | | |
| 2385- | 1 | 122 | 11002 | 5 | -1.0000011001 | 5 | 4.0.95105 | | | |
| EM21116 | 1 | 122 | 11002 | 6 | -1.0000011001 | 6 | 5.0.30901 | | | |
| 2386- | 1 | 122 | 11002 | 1 | -1.0000011001 | 1 | 6.0.95105 | | | |
| EM21117 | 1 | 122 | 11002 | 2 | -1.0000011001 | 2 | 1.00000 | | | |
| 2387- | 1 | 122 | 11002 | 3 | -1.0000011001 | 3 | 2.0.58778 | | | |
| EM21118 | 1 | 122 | 11002 | 4 | -1.0000011001 | 4 | .00000 | | | |
| 2388- | 1 | 122 | 11002 | 5 | -1.0000011001 | 5 | 4.0.95105 | | | |
| EM21119 | 1 | 122 | 11002 | 6 | -1.0000011001 | 6 | 5.0.30901 | | | |
| 2389- | 1 | 122 | 11002 | 1 | -1.0000011001 | 1 | 6.0.95105 | | | |
| EM21120 | 1 | 122 | 11002 | 2 | -1.0000011001 | 2 | 1.00000 | | | |
| 2390- | 1 | 122 | 11002 | 3 | -1.0000011001 | 3 | 2.0.58778 | | | |
| EM21121 | 1 | 122 | 11002 | 4 | -1.0000011001 | 4 | .00000 | | | |
| 2391- | 1 | 122 | 11002 | 5 | -1.0000011001 | 5 | 4.0.95105 | | | |
| EM21122 | 1 | 122 | 11002 | 6 | -1.0000011001 | 6 | 5.0.30901 | | | |
| 2392- | 1 | 122 | 11002 | 1 | -1.0000011001 | 1 | 6.0.95105 | | | |
| EM21123 | 1 | 122 | 11002 | 2 | -1.0000011001 | 2 | 1.00000 | | | |
| 2393- | 1 | 122 | 11002 | 3 | -1.0000011001 | 3 | 2.0.58778 | | | |
| EM21124 | 1 | 122 | 11002 | 4 | -1.0000011001 | 4 | .00000 | | | |
| 2394- | 1 | 122 | 11002 | 5 | -1.0000011001 | 5 | 4.0.95105 | | | |
| EM21125 | 1 | 122 | 11002 | 6 | -1.0000011001 | 6 | 5.0.30901 | | | |
| 2395- | 1 | 122 | 11002 | 1 | -1.0000011001 | 1 | 6.0.95105 | | | |
| EM21126 | 1 | 122 | 11002 | 2 | -1.0000011001 | 2 | 1.00000 | | | |
| 2396- | 1 | 122 | 11002 | 3 | -1.0000011001 | 3 | 2.0.58778 | | | |
| EM21127 | 1 | 122 | 11002 | 4 | -1.0000011001 | 4 | .00000 | | | |
| 2397- | 1 | 122 | 11002 | 5 | -1.0000011001 | 5 | 4.0.95105 | | | |
| EM21128 | 1 | 122 | 11002 | 6 | -1.0000011001 | 6 | 5.0.30901 | | | |
| 2398- | 1 | 122 | 11002 | 1 | -1.0000011001 | 1 | 6.0.95105 | | | |
| EM21129 | 1 | 122 | 11002 | 2 | -1.0000011001 | 2 | 1.00000 | | | |
| 2399- | 1 | 122 | 11002 | 3 | -1.0000011001 | 3 | 2.0.58778 | | | |
| EM21130 | 1 | 122 | 11002 | 4 | -1.0000011001 | 4 | .00000 | | | |
| 2400- | 1 | 122 | 11002 | 5 | -1.0000011001 | 5 | 4.0.95105 | | | |
| EM21131 | 1 | 122 | 11002 | 6 | -1.0000011001 | 6 | 5.0.30901 | | | |

AXISYMMETRIC CIRC. CYL. WITH FLUID
HARMONIC REDUCTION

MAY 4. 1974 NASTRAN 5/13/72

SORTED BULK DATA ECHO

| CARD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------|---------|-------|-------------|-------|-----|---|---|---|---|---------|
| COUNT | 1 | 122 | 5 | | | | | | | |
| 2401- | MP | | | | | | | | | CM21115 |
| 2402- | CM21115 | | | | | | | | | |
| 2403- | MP | 122 | 11002 | 6 | | | | | | CM21116 |
| 2404- | CM21116 | | | | | | | | | |
| 2405- | CMIT1 | 26 | 11002 | 11003 | | | | | | |
| 2406- | CMIT1 | 35 | 1001 | | | | | | | |
| 2407- | CMIT1 | 35 | 2001 | 3001 | | | | | | |
| 2408- | CMIT1 | 35 | 9001 | 10001 | | | | | | |
| 2409- | CMIT1 | 345 | 1002 | 1003 | | | | | | |
| 2410- | CMIT1 | 23456 | 2002 | 2003 | | | | | | |
| 2411- | CMIT1 | 23456 | 5002 | 5003 | | | | | | |
| 2412- | CMIT1 | 23456 | 8002 | 8003 | | | | | | |
| 2413- | PL0AD2 | 1 | -1.055-52 | THRU | 11 | | | | | |
| 2414- | PL0AE2 | 1 | -1.055-513 | THRU | 22 | | | | | |
| 2415- | PL0AD2 | 1 | -1.055-524 | THRU | 33 | | | | | |
| 2416- | PL0AE2 | 1 | -1.055-535 | THRU | 44 | | | | | |
| 2417- | PL0AD2 | 1 | -1.055-546 | THRU | 55 | | | | | |
| 2418- | PL0AE2 | 1 | -1.055-557 | THRU | 66 | | | | | |
| 2419- | PL0AD2 | 1 | -1.055-568 | THRU | 77 | | | | | |
| 2420- | PL0AE2 | 1 | -1.055-579 | THRU | 88 | | | | | |
| 2421- | PL0AD2 | 1 | -1.055-590 | THRU | 99 | | | | | |
| 2422- | PL0AD2 | 1 | -1.055-5101 | THRU | 110 | | | | | |
| 2423- | PL0AD2 | 1 | .01 | | | | | | | |
| 2424- | SPC1 | 1 | 1 | 1001 | | | | | | |
| 2425- | SPC1 | 1 | 35 | 11001 | | | | | | |
| 2426- | SPC1 | 1 | 126 | 1002 | | | | | | |
| 2427- | SPC1 | 1 | 246 | 1001 | | | | | | |
| 2428- | SPC1 | 1 | 246 | 7001 | | | | | | |
| 2429- | SPC1 | 1 | 345 | 11002 | | | | | | |
| ENDCATA | | | | | | | | | | |

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MAY 4, 1974 NASTRAN 5/13/72

AXISYMMETRIC CIRC. CYL. WITH FLUID
HARMONIC REDUCTION

NASTRAN SOURCE PROGRAM COMPILE ION
OMAP-UMAP INSTRUCTION
NU.

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1 BEGIN NO.13 NCRPAL MODES WITH DIFFERENTIAL STIFFNESS - SERIES M $
2 FILE LLE-TAPE $
3 GPI GEOM1, GEOM2, /GPL, EDEXIN, GPDT, CSTM, BGPDT, SIL/V, N, LUSET/ C, N,
  123/V, N, NCGPDT $
4 SAVE LUSET $
5 CHKPNT GPL, EDEXIN, GPDT, CSTM, BGPDT, SIL $
6 GP2 GEOM2, EDEXIN/ECT $
7 CHKPNT ECT $
8 PLTSET PCDE, EDEXIN, ECT/PLTSETX, PLTPAR, GPSETS, ELSETS/V, N, NSIL/ V, N,
  JUMPPLOT $
9 SAVE NSIL, JUMPPLOT $
10 PRIMSG PLTSETX// $
11 SETVAL //V, N, PLTFLG/C, N, 1/V, N, PFILE/C, N, 0 $
12 SAVE PLTFLG, PFILE $
13 GEND P1, JUMPPLOT $
14 PLUT PLTPAR, GPSETS, ELSETS, CASECC, BGPDT, EDEXIN, SIL, /PLUTX1/ V, N,
  NSIL/V, N, LUSET/V, N, JUMPPLOT/V, N, PLTFLG/V, N, PFILE $
15 SAVE JUMPPLOT, PLTFLG, PFILE $
16 PRIMSG PLUTX1// $
17 LABEL, P1 $
18 CHKPNT PLTPAR, GPSETS, ELSETS $
19 GP3 GEOM3, EDEXIN, GEOM2/SLT, GPIT/C, N, 123/V, N, NOGRAV/C, N, 12J $
20 CHKPNT SLT, GPIT $
21 TAIL, ECT, EPT, BGPDT, SIL, GPIT, CSTM/EST, GEI, ECT, GPCT/V, N, LUSET/ C, N,
  123/V, N, NCSIMP/C, N, 0/V, N, NOGENL/V, N, GENEL $
22 SAVE NOSIMP, NCGENL, GENEL $

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MAY 4, 1974 NASTRAN 5/13/72

AXISYMMETRIC CIRC. CYL. WITH FLUID
HARMONIC REDUCTION

N A S T R A N S O U R C E P R O G R A M C O M P I L A T I O N

DMAP-DMAP INSTRUCTION
NU.

| | | |
|----|--------|--|
| 23 | CUND | ERROR1,NC5IMP \$ |
| 24 | PURGE | OGPST/GENEL \$ |
| 25 | CHKPNT | EST,ECPT,GPCT,GEI,OGPST \$ |
| 26 | SMA3 | CSTM,MPT,ECPT,GPCT,DIT/KGGX,GPST/V,N,NGENL/V,N,NOKSGG \$ |
| 27 | CHKPNT | GPST,KGGX \$ |
| 28 | SMA2 | CSTM,MPT,ECPT,GPCT,DIT/MGG,/V,Y,MTMASS=1.0/V,N,NOMGG/V,N,NOMGG/
V,Y,COURPMASS/V,Y,CBAR/V,Y,CPRD/V,Y,CPOUAD1/V,Y,CPOUAD2/
V,Y,CPTRIA1/V,Y,CPTRIA2/V,Y,CPTUBE/V,Y,CPOOPLT/V,Y,CPTRPLT/
CPTRESC \$ |
| 29 | SAVE | NOMGG \$ |
| 30 | CHKPNT | MGG \$ |
| 31 | CUND | ERRORS,NOMGG \$ |
| 32 | CUND | LBL1,GRDENT \$ |
| 33 | GPWG | UGPDT,CSTM,EOEXIN,MGG/OGPWG/V,Y,GRDENT=-1/V,Y,MTMASS \$ |
| 34 | OFF | OGPWG,....//V,N,CARDNO \$ |
| 35 | SAVE | CARDNO \$ |
| 36 | LABEL | LBL1 \$ |
| 37 | EQUIV | KGGX,KGG/NGENL \$ |
| 38 | CHKPNT | KGG \$ |
| 39 | CUND | LBL1,NGENL \$ |
| 40 | SMA3 | GEI,KGGX/KGG/V,N,LUSET/V,N,NGENL/C,N,-1 \$ |
| 41 | CHKPNT | KGG \$ |
| 42 | LABEL | LBL1 \$ |
| 43 | PARAM | //C,N,MPY/V,N,NSKIP/C,N,0/C,N,0 \$ |
| 44 | GP4 | CASECC,CEOM4,EOEXIN,SIL,GPDT/RG,YS,LUSET/V,N,LUSET/V,N,MPCF1/
V,N,MPCF2/V,N,SINGLE/V,N,OMIT/V,N,REACT/V,N,NSKIP/V,N,REPEAT/
V,N,NUSET/V,N,NUL/V,N,NOA \$ |
| 45 | SAVE | MPCF1,MPCF2,SINGLE,OMIT,REACT,NSKIP,REPEAT,NUSET,NUL,NCA \$ |

N A S T R A N S C U R C E P R O G R A M C O M P I L A T I O N

DMAP-DMAP INSTRUCTION

NO.

| | | |
|----|--------|--|
| 46 | CUND | ERRR6,NOA \$ |
| 47 | PARAM | //C.N.ANC/V.N.NGSR/V.N.SINGLE/V.N.REACT \$ |
| 48 | PURGE | GM/MPCF1/GC,KDG,L00,U00,PO,U00V,R00V/OMIT/PS,KFS,KSS/SINGLE/
QJ/NU5H \$ |
| 49 | EQUIV | KGG,KNN/MPCF1 \$ |
| 50 | CHKPNT | GM,KG,GC,K00,L0G,U00,PO,U00V,R00V,YS,PS,KFS,KSS,USET,OG,KNN \$ |
| 51 | CUND | LBL4D,REACT \$ |
| 52 | JUMP | ERROR2 \$ |
| 53 | LABEL | LBL4C \$ |
| 54 | CUND | LBL4,GENEL \$ |
| 55 | GPSP | GPL,GPST,USET,SIL/OGPST \$ |
| 56 | JFP | OGPST,....//V.N.CARDNO \$ |
| 57 | SAVE | CARDNO \$ |
| 58 | LABEL | LBL4 \$ |
| 59 | CUND | LBL2,MPCF2 \$ |
| 60 | MCE1 | USET,RG/GM \$ |
| 61 | CHKPNT | GM \$ |
| 62 | MCE2 | USET,GP,KGG,....KNN,.... \$ |
| 63 | CHKPNT | KNN \$ |
| 64 | LABEL | LBL2 \$ |
| 65 | EQUIV | KNN,KFF/SINGLE \$ |
| 66 | CHKPNT | KFF \$ |
| 67 | CUND | L0L3,SINGLE \$ |
| 68 | SCE1 | USET,KNN,....KFF,KFS,KSS,.... \$ |
| 69 | CHKPNT | KFS,KSS,KFF \$ |
| 70 | LABEL | L0L3 \$ |

NASTRAN SOURCE PROGRAM COMPILATION

OMAP-UMAP INSTRUCTION

NU.

| | | |
|----|--------|---|
| 71 | EQUIV | KFF,KAA/CMIT \$ |
| 72 | CHKPNT | KAA \$ |
| 73 | COND | LBL5,CMIT \$ |
| 74 | SMP1 | USET,KFF.../GO,KAA,KOD,LOO,UOO..... \$ |
| 75 | CHKPNT | GO,KAA,KGO,LOO,UOO \$ |
| 76 | LABEL | LBL5 \$ |
| 77 | MBMG2 | KAA/LLL,ULL \$ |
| 78 | CHKPNT | ULL,LLL \$ |
| 79 | SSG1 | SLT,BGPDT,CSTM,SIL,EST,MPT,GPTT,EDT,MGG,CASECC,DIT/PG/ V.N.
LUSET/C.N.1 \$ |
| 80 | CHKPNT | PG \$ |
| 81 | EQUIV | PG,PL/NCSET \$ |
| 82 | CHKPNT | PL \$ |
| 83 | COND | LBL10,NCSET \$ |
| 84 | SSG2 | USET,GN,YS,KFS,GO,PG,PD,PS,PL \$ |
| 85 | CHKPNT | PD,PS,PL \$ |
| 86 | LABEL | LBL10 \$ |
| 87 | SSG3 | LLL,ULL,KAA,PL,LOO,UOO,KOD,PO/JLV,UCGV,RULV,V.N.CMIT/ V.Y.
IRES=-1/C.N.1/V.N.EPSI \$ |
| 88 | SAVE | EPSI \$ |
| 89 | CHKPNT | ULV,UOOV,RULV,RUOV \$ |
| 90 | COND | LBL9,IRES \$ |
| 91 | MATGPR | GPL,USET,SIL,RULV//C.N.L \$ |
| 92 | MATGPR | GPL,USET,SIL,RUOV//C.N.O \$ |
| 93 | LABEL | LBL9 \$ |
| 94 | SUK1 | USET,PG,ULV,UOOV,YS,GO,GM,PS,KFS,KSS,/UCGV,PGG,DI/C.N.1/C.N.
BKLO \$ |

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AXISYMMETRIC CIRC. CYL. WITH FLUID
HARMONIC REDUCTION

N A S T R A N S U R C E P R O G R A M C O M P I L A T I O N

DMAP-DMAP INSTRUCTION

NU.

```

95  CHKPT  UGV,GG,PGG $
96  SUR2   CASECC,CSTM,MPT,DIT,EQEXIN,SIL,GPTT,EDT,BGPD,PGG,QG,UGV,EST, /
          OPGI,QQGI,CUGVI,DESI,DEFI,PUGVI/C,N,BKLO $
97  DFP    DUGVI,DFGI,QQGI,DEFI,DESI, /V,N,CARDNO $
98  SAVE   CARDNO $
99  CUND   P2,JUMPFLOT $
100  PLUT   PLTPAR,GPSET'S,ELSET'S,CASECC,BGPD,EQEXIN,SIL,PUGVI, /PLCTX2/V,N,
          NSIL/V,N,LUSET/V,N,JUMPFLOT/V,N,PLTFLG/V,N,PFILE $
101  SAVE   PFILE $
102  PRMSG  PLOTX2// $
103  LABEL  P2 $
104  DMSG1  CASECC,GPTT,SIL,EDT,UGV,CSTM,MPT,ECPT,GPT,DIT/KQGS/ V,N,
          DSCDSET $
105  CHKPT  KQGS $
106  ADD    KQGS,KGG/KEGG $
107  EQUIV  KQGS,KDNN/MPCF2 / MGG,MNN/MPCF2 $
108  CHKPT  KDNN,MNN $
109  CUND   LBL2U,MPCF2 $
110  MCE2   USET,GM,KQGS,MGG, /KDNN,MNN, $
111  CHKPT  KDNN,MNN $
112  LABEL  LBL2C $
113  EQUIV  KDNN,KDFF/SINGLE / MNN,MFF/SINGLE $
114  CHKPT  KUFF,MFF $
115  CUND   LBL3U,SINGLE $
116  SCE1   USET,KDNN,MNN, /KDFF,KDFS,MFF, $
117  CHKPT  KDFF,KDFS,MFF $
118  LABEL  LBL3C $

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AXISYMMETRIC CIRC. CYL. WITH FLUID
HARMONIC REDUCTION

ANAS TRAN SOURCE PROGRAM COMPILATION

NUM-UMAP INSTRUCTION

EQUITY KOFF,KCAP/CNIT / NFF,MVA/CNIT \$

120 CHKPNT KDAA, MAP \$

121 COND 8 11WJ 05797

122 SMP2 USET,GO,KCFF/KCAA 3

123 SMP2 USSET,GO,NFF/MAA 3

124 CHKENT KDAA,MAA \$

123 LABEL LUL50 3

125. AUD MAF, MFLD/MAH \$

123 PANAM //C.N.NCP/V.N.TRUE=-1 5

125 EQUIV MAH. MAAT/TRUE S

125 CLND MAHNO9, TRUE 3

123 MATPRA MAH...// S

123 LABEL MAHND9 \$

```

145 DPW
DYNAMICS,GPL,SIL,USET/GPLD,SILD,USETD.....,EED,EOOYN/V,N,
LJSET/V,N,USETD/V,N,NOTFL/V,N,MODLT/V,N,NOPSUL/V,N,NDFAL/V,
N,N,INF,FT/V,N,NCTAL/V,N,NDEED/C,N,123/V,N,NQUE $

```

127 SAVE NOED S

128 COND ERKURJ, NCEC 5

124 INKENT ELU 5

100 SEE MAT MGG. K8G6. // C. N. PRINT \$

130 READ KDAAMAA...EEDUSEY,CASECC/LAMA,PHIA...DEIGS/C.A.H.MUES/V.N.
NEIGW/C.N.2 5

131 SAVE NEIGV 3

1.12 CHKPNT LAMA.PHIA.CEIGS \$

DEPT. OF COMMERCE
UNITED STATES OF AMERICA
WASHINGTON, D. C. 20540

1-23 MAY 7 0800Z (APR) 8

100-443887-100

N A S T R A N S E U R C E P R O G R A M C O M P I L A T I O N

DMAP-UNAP INSTRUCTION

NO.

| | | |
|-----|---------|---|
| 130 | SDRI | USET,PHIA,GO,GM,KDFS,PHIG,BQG/C,N,1/C,N,BKL1 \$ |
| 137 | CHKPNT | PHIG,BQG \$ |
| 139 | SUR2 | CASECC,CSTN,MPT,CIT,EGEXIN,SIL,EGPDT,LAMA,BQG,PHIG,EST,OBQGI,OPHIG,OBES1,UBEF1,PPHIG/C,N,BKL1 \$ |
| 139 | OFF | OPHIG,OBQGI,UBEF1,OBES1,VB,N,CARDNG \$ |
| 140 | SAVE | CARDNG \$ |
| 140 | SMPYAD | PHIA,KCAP,PTIA,KH/C,N,3/C,N,1/C,N,2/C,N,1 \$ |
| 140 | SMPYAD | PHIA,MAA,PHIA,MI/C,N,3/C,N,1/C,N,2/C,N,1 \$ |
| 140 | SOLVE | MI,KH/WH/C,N,1 \$ |
| 140 | SMPYAD | PDJ2,PHIA,WH,PC2/C,N,3 \$ |
| 140 | MPYAD | TU12,PHIA,PHF/C,N,0 \$ |
| 140 | MATPRN | WH,PD2,PHF, \$ |
| 141 | CUNG | P3,JUMPPLDT \$ |
| 142 | PLJT | PLTPAR,GPSETS,ELSETS,CASECC,BGPDT,EGEXIN,SIL,PPHIG/PLTIX3/V,N,NSIL/V,N,LUSET/V,N,JUMPPLDT/V,N,PLTFLG/V,N,PFILE \$ |
| 143 | SAVE | PFILE \$ |
| 144 | PRMSG | PLTIX3 \$ |
| 145 | LAUEL | P3 \$ |
| 146 | JUMP | FINIS \$ |
| 147 | LAUEL | ERRR1 \$ |
| 148 | PRTPARM | //C,N,-1/C,N,BUCKLING \$ |
| 149 | LAUEL | ERRR2 \$ |
| 150 | PRTPARM | //C,N,-2/C,N,BUCKLING \$ |
| 151 | LAUEL | ERRR3 \$ |
| 152 | PRTPARM | //C,N,-3/C,N,BUCKLING \$ |
| 153 | LAUEL | ERRR4 \$ |

AXISYMMETRIC CIRC. CYL. WITH FLUID
HARMONIC REDUCTION
MAY 4. 1974 NASTRAN 5/13/72

NASTRAN SOURCE PROGRAM COMPILATION
UNAP-UNAP INSTRUCTION
NO.

154 PRTPARM //C.N.-4/C.N.BUCKLING \$

155 LABEL ERRORS \$

156 PRTPARM //C.N.-5/C.N.BUCKLING \$

157 LABEL ERRORS \$

158 PRTPARM //C.N.-6/C.N.BUCKLING \$

159 LABEL FINIS \$

160 END \$

NO ERRORS FOUND - EXECUTE NASTRAN PROGRAM

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